IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF DELAWARE

MUSIC CHOICE, Plaintiff, v. VIACOM, INC., VIACOM INTERNATIONAL, INC., and MTV NETWORKS Defendants.	)	Civil Action No. _____ **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff, Music Choice, by its undersigned attorneys, demands a trial by jury of all claims and issues so triable, and, as and for its Complaint for Patent Infringement against Defendants, Viacom, Inc. ("Viacom"), Viacom International, Inc. ("Viacom International") and MTV Networks ("MTVN") (collectively, "Defendants"), hereby alleges the following:

NATURE OF THE ACTION

1. This is a civil action for patent infringement. Plaintiff's claims are based on the unauthorized, infringing manufacture, use, sale and/or offer for sale by Defendants of their digital music service referred to as "URGE Radio."

THE PARTIES

2. Plaintiff Music Choice is a Pennsylvania general partnership, and has its principal place of business at 110 Gibraltar Road, Suite 200, Horsham, PA 19044. Music Choice is doing business in this judicial district.

3. Music Choice is a pioneer in the digital music field. In 1990, the founders of Music Choice launched one of the first digital audio services in the World. Since that time, Music Choice has significantly expanded its programming services and, today, provides a multi-platform music network. Music Choice has been, and continues to be, a leading innovator of the technology enabling the programming, production and distribution of video and audio music content for digital cable and satellite television, broadband (PCs) and cell phones.

4. Defendant Viacom is a corporation organized and existing under the laws of the State of Delaware. On information and belief, Viacom has its principal place of business at 1515 Broadway, New York, NY 10036. Viacom is doing business in this judicial district.

5. Defendant Viacom International is a corporation organized and existing under the laws of the State of Delaware, and is a wholly-owned subsidiary of Viacom. On information and belief, Viacom International has its principal place of business at 1515 Broadway, New York, NY 10036. Viacom International is doing business in this judicial district.

6. Defendant MTVN is a division of Viacom International and, on information and belief, is a corporation organized and existing under the laws of the State of Delaware. On information and belief, MTVN has its principal place of business at 1515 Broadway, New York, NY 10036. MTVN is doing business in this judicial district.

JURISDICTION AND VENUE

7. This is an action for patent infringement arising under the provisions of the Patent Laws of the United States, 35 U.S.C. §§ 271, 281, and 283-285. This Court has subject matter jurisdiction over this action pursuant to 28 U.S.C. §§ 1331 and 1338(a).

8. On information and belief, the Defendants have solicited business in the State of Delaware, transacted business within the State of Delaware and attempted to derive financial benefit from residents of the State of Delaware, including benefits directly related to the instant patent infringement cause of action set forth herein.

9. On information and belief, the Defendants have placed their infringing systems into the stream of commerce, and practiced their infringing methods, throughout the United States with the expectation that they will be offered for sale, sold and used in this judicial district, which systems and methods have been offered for sale, sold and used in this judicial district.

10. Each defendant is a corporation organized and existing under the laws of the State of Delaware and is conducting business in this judicial district.

11. Each defendant is subject to personal jurisdiction in this judicial district.

12. Venue is proper in this judicial district pursuant to 28 U.S.C. §§ 1391(b), 1391(c) and/or 1400(b).

PATENTS-IN-SUIT

13. On September 25, 2007, U.S. Patent No. 7,275,256 ("'256 patent"), entitled "System and Method for Providing an Interactive, Visual Complement to an Audio Program," was duly and legally issued by the United States Patent and Trademark Office. Music Choice is the owner by valid assignment of all right, title and interest in and to the '256 patent, including

the right to sue for and recover all past, present and future damages for infringement of the '256 patent. A true and correct copy of the '256 patent is attached hereto as Exhibit A.

14. On January 2, 2007, U.S. Patent No. 7,158,169 ("'169 patent"), entitled "Method and System for Displaying Content While Reducing Burn-In of a Display," was duly and legally issued by the United States Patent and Trademark Office. Music Choice is the owner by valid assignment of all right, title and interest in and to the '169 patent, including the right to sue for and recover all past, present and future damages for infringement of the '169 patent. A true and correct copy of the '169 patent is attached hereto as Exhibit B.

DEFENDANTS' INFRINGING ACTS

15. Defendants own, operate and are otherwise responsible for a digital music service referred to as "URGE Radio," which is available through television services, including cable television systems and fiber optic television systems, such as Verizon's FiOS TV service. Defendants' URGE Radio digital music service provides digital audio channels with continuous music and complements the audio on each channel with a video image, including artist and song information and/or other information. On information and belief, Defendants have used and continue to use Music Choice's patented technology by providing the URGE Radio service, which is available to residents in this judicial district.

COUNT I
(INFRINGEMENT OF U.S. PATENT NO. 7,275,256)

16. Music Choice incorporates by reference each of the allegations in paragraphs 1-15 above.

17. On information and belief, Defendants Viacom, Viacom International and MTVN, either alone or in conjunction with others, have infringed, contributed to the infringement of, and/or induced others to infringe the '256 patent and, unless enjoined, will continue to infringe the '256 patent by making, using, selling and/or offering for sale, in this judicial district and elsewhere, systems and methods that are covered by one or more claims of the '256 patent.

18. Defendants' actions as alleged in paragraph 17 are without the consent of Music Choice and violate 35 U.S.C. § 271.

19. Music Choice has been seriously damaged and irreparably injured by Defendants' infringement of the '256 patent, and will suffer additional irreparable damage and impairment of the value of its patent rights unless Defendants are enjoined by this Court from continuing to infringe the '256 patent.

20. At the present time, it is not known whether Defendants are deliberately and willfully infringing the '256 patent. Music Choice intends to pursue discovery to determine whether any of the Defendants are deliberately and willfully infringing the '256 patent, at which time Music Choice will, if necessary, amend its complaint.

21. Music Choice is entitled to recover damages from the Defendants to compensate it for the infringement.

COUNT II
(INFRINGEMENT OF U.S. PATENT NO. 7,158,169)

22. Music Choice incorporates by reference each of the allegations in paragraphs 1-21 above.

23. On information and belief, Defendants Viacom, Viacom International and MTVN, either alone or in conjunction with others, have infringed, contributed to the infringement of, and/or induced others to infringe the '169 patent and, unless enjoined, will continue to infringe the '169 patent by making, using, selling and/or offering for sale, in this judicial district and elsewhere, systems and methods that are covered by one or more claims of the '169 patent.

24. Defendants' actions as alleged in paragraph 23 are without the consent of Music Choice and violate 35 U.S.C. § 271.

25. Music Choice has been seriously damaged and irreparably injured by Defendants' infringement of the '169 patent, and will suffer additional irreparable damage and impairment of the value of its patent rights unless Defendants are enjoined by this Court from continuing to infringe the '169 patent.

26. At the present time, it is not known whether Defendants are deliberately and willfully infringing the '169 patent. Music Choice intends to pursue discovery to determine whether any of the Defendants are deliberately and willfully infringing the '169 patent, at which time Music Choice will, if necessary, amend its complaint.

27. Music Choice is entitled to recover damages from the Defendants to compensate it for the infringement.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff Music Choice prays for the entry of a judgment from this Court:

(a) Declaring that each of the '256 and '169 patents was duly and legally issued, is valid and is enforceable;

(b) Declaring that Defendants have directly infringed, contributorily infringed and/or induced the infringement of one or more claims of each of the '256 and '169 patents;

(c) Permanently enjoining Defendants, their officers, directors, employees, agents, attorneys, privies, successors, and assigns, and all persons and entities acting in concert or participation with Defendants, under its authority or control, or on its behalf, from committing further acts of infringement of the '256 and '169 patents;

(d) Ordering Defendants to file with this Court and to serve upon Plaintiff Music Choice within thirty (30) days after service upon Defendant of an injunction issued by the Court in this action a report in writing under oath setting forth in detail the manner in which Defendants have complied with such injunction;

(e) Ordering an accounting for the damages to Plaintiff Music Choice arising out of Defendants' infringing activities;

(f) Awarding Music Choice damages in accordance with 35 U.S.C. § 284;

(g) Deeming this to be an "exceptional case" within the meaning of 35 U.S.C. § 285, entitling Music Choice to an award of its reasonable attorney fees, expenses and costs in this action;

(h) Awarding Music Choice its reasonable attorney fees, expenses and costs in this action in accordance with 35 U.S.C. § 285;

(i) Awarding Plaintiff Music Choice pre-judgment and post-judgment interest; and

(j) Awarding Plaintiff Music Choice such other and further relief as this Court may deem just and proper.

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Dated: March 4, 2008

US007275256B1

(12) **United States Patent**
Del Beccaro et al.

(10) **Patent No.: US 7,275,256 B1**
(45) **Date of Patent: Sep. 25, 2007**

(54) **SYSTEM AND METHOD FOR PROVIDING AN INTERACTIVE, VISUAL COMPLEMENT TO AN AUDIO PROGRAM**

(75) Inventors: **David J. Del Beccaro**, Jenkintown, PA (US); **Stuart H. Farber**, Horsham, PA (US); **Kelley L. Giannetti**, Gilbertsville, PA (US); **Donna M. O'Neill**, North Wales, PA (US); **Jeremy C. Rosenberg**, Havre de Grace, MD (US); **Robert M. Steinberg**, Horsham, PA (US); **Christina B. Tancredi**, Ambler, PA (US); **Ronald M. Yurman**, West Orange, NJ (US)

(73) Assignee: **Music Choice**, Horsham, PA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1201 days.

(21) Appl. No.: **10/066,793**

(22) Filed: **Feb. 6, 2002**

Related U.S. Application Data

(60) Provisional application No. 60/315,046, filed on Aug. 28, 2001.

(51) **Int. Cl.**
H04N 7/16 (2006.01)

(52) **U.S. Cl.** **725/143**; 725/114; 725/144; 709/217; 709/219

(58) **Field of Classification Search** 707/10, 707/104.1; 709/217–219, 203, 104.1, 10, 709/231; 725/114–118, 143–148
See application file for complete search history.

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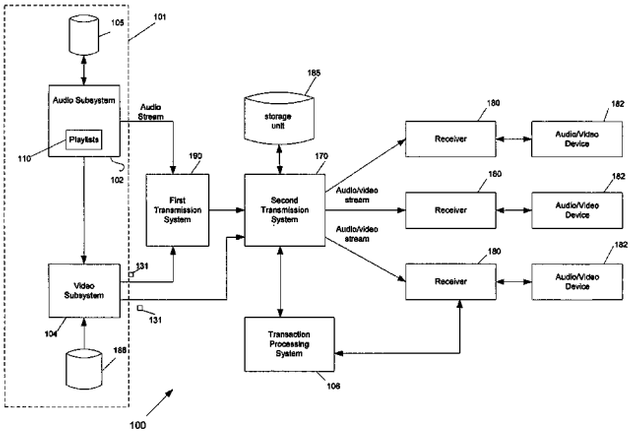
Primary Examiner—Ngoc Vu
(74) *Attorney, Agent, or Firm*—Rothwell, Figg, Ernst & Manbeck

(57) **ABSTRACT**

A system and method for providing an interactive, visual complement to one or more audio programs. In one aspect, the system comprises an audio subsystem for generating an audio signal corresponding to a sound recording. The system also comprises a video subsystem for generating a video image specification based, at least in part, on the sound recording. In one aspect, the audio signal and video image specification are transmitted to an audio/video signal transmission system. The transmission system receives the video image specification and generates a video signal that conforms to the video image specification. The video signal and the audio signal are transmitted to at least one consumer receiver. In this way, the system provides a visual complement to an audio program.

21 Claims, 21 Drawing Sheets



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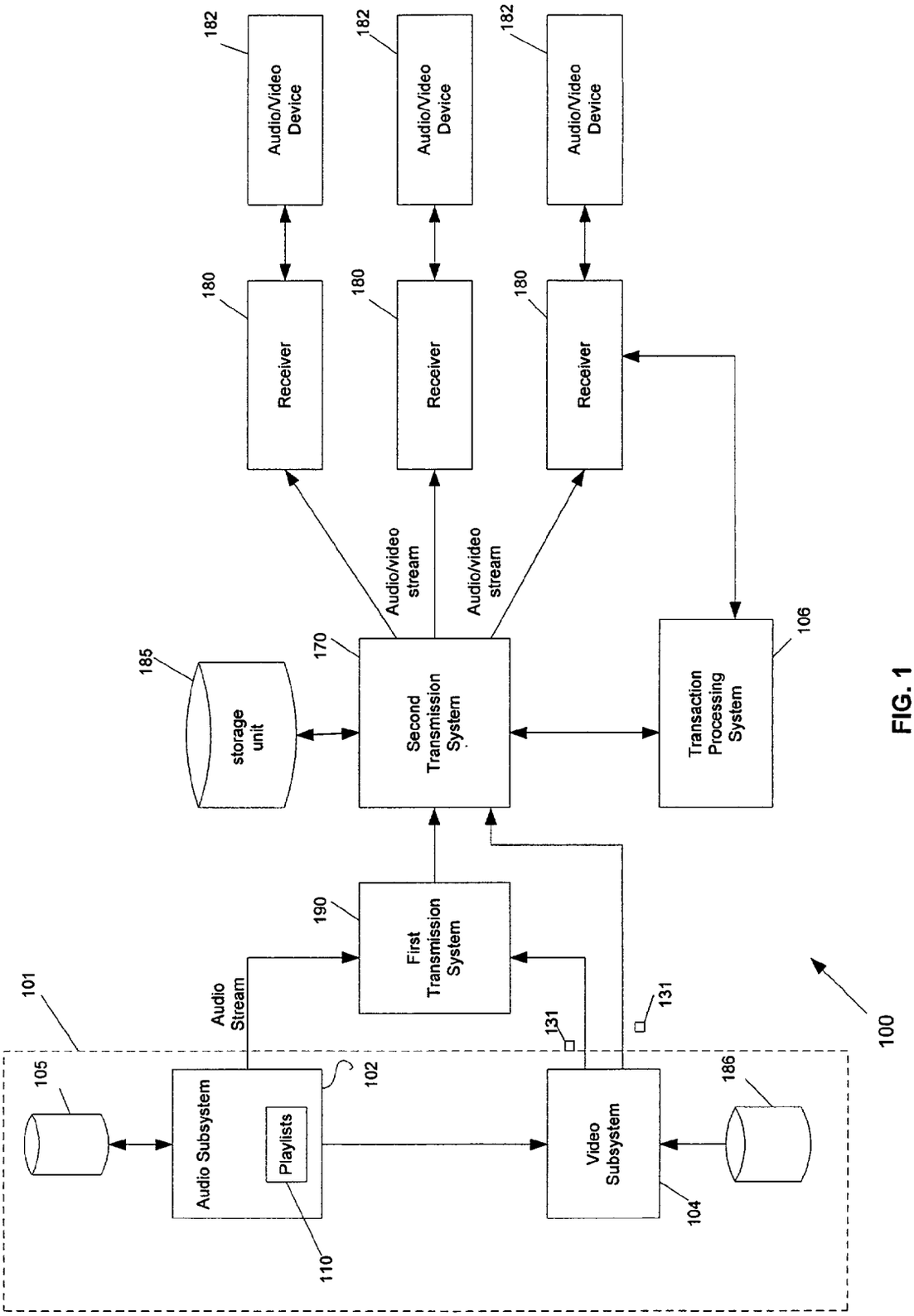
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Audio/Video Device
182
Audio/Video Device
182
Audio/Video Device
180
Receiver
180
Receiver
180
Receiver
Audio/video stream
Audio/video stream
185
storage unit
170
Second Transmission System
106
Transaction Processing System
190
First Transmission System
Audio Stream
101
131
131
100
105
Audio Subsystem
Playlists
102
Video Subsystem
186
104
110

FIG. 1

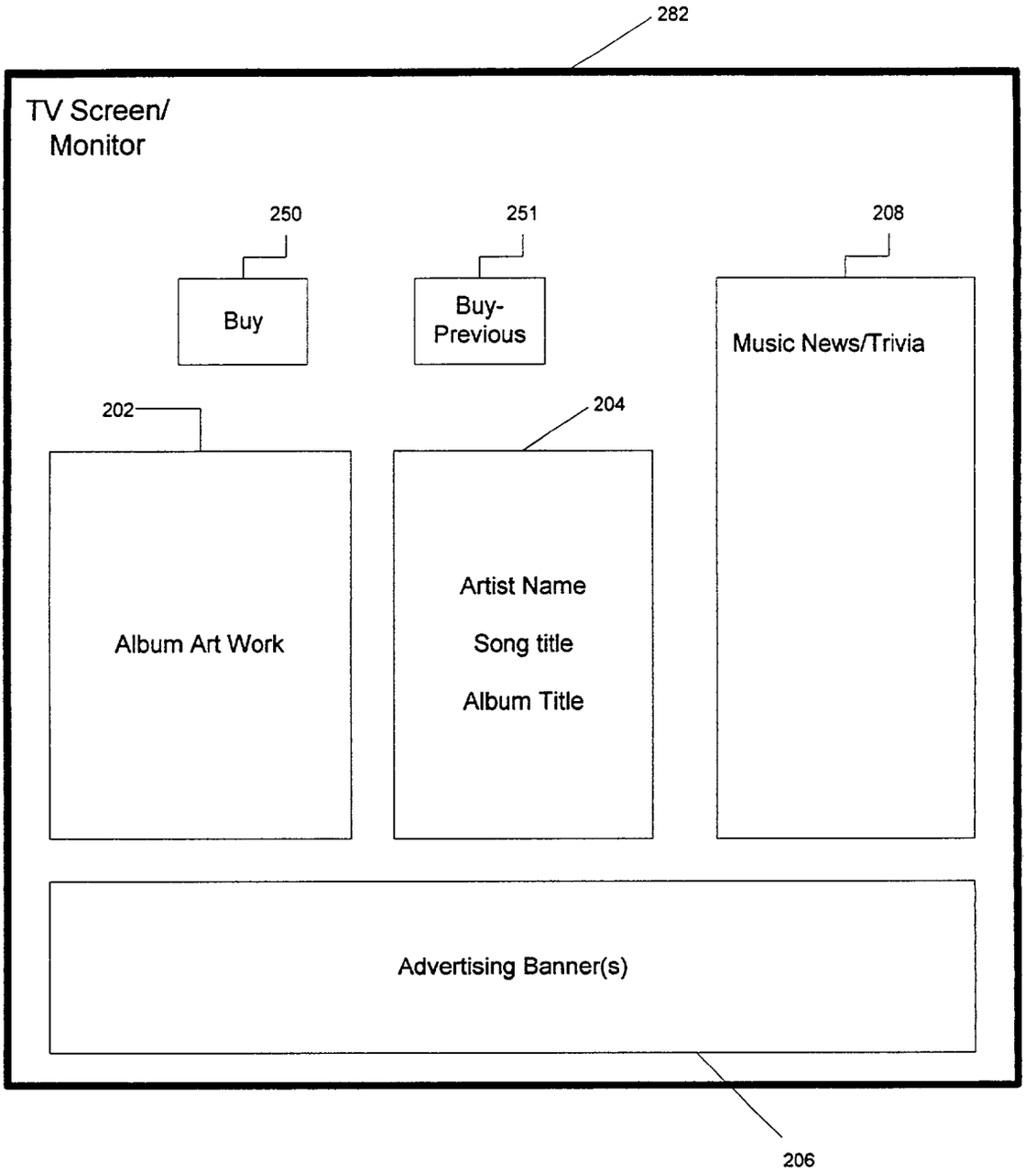
282
TV Screen/
Monitor
250
Buy
251
Buy-
Previous
208
Music News/Trivia
202
Album Art Work
204
Artist Name
Song title
Album Title
Advertising Banner(s)
206

FIG. 2

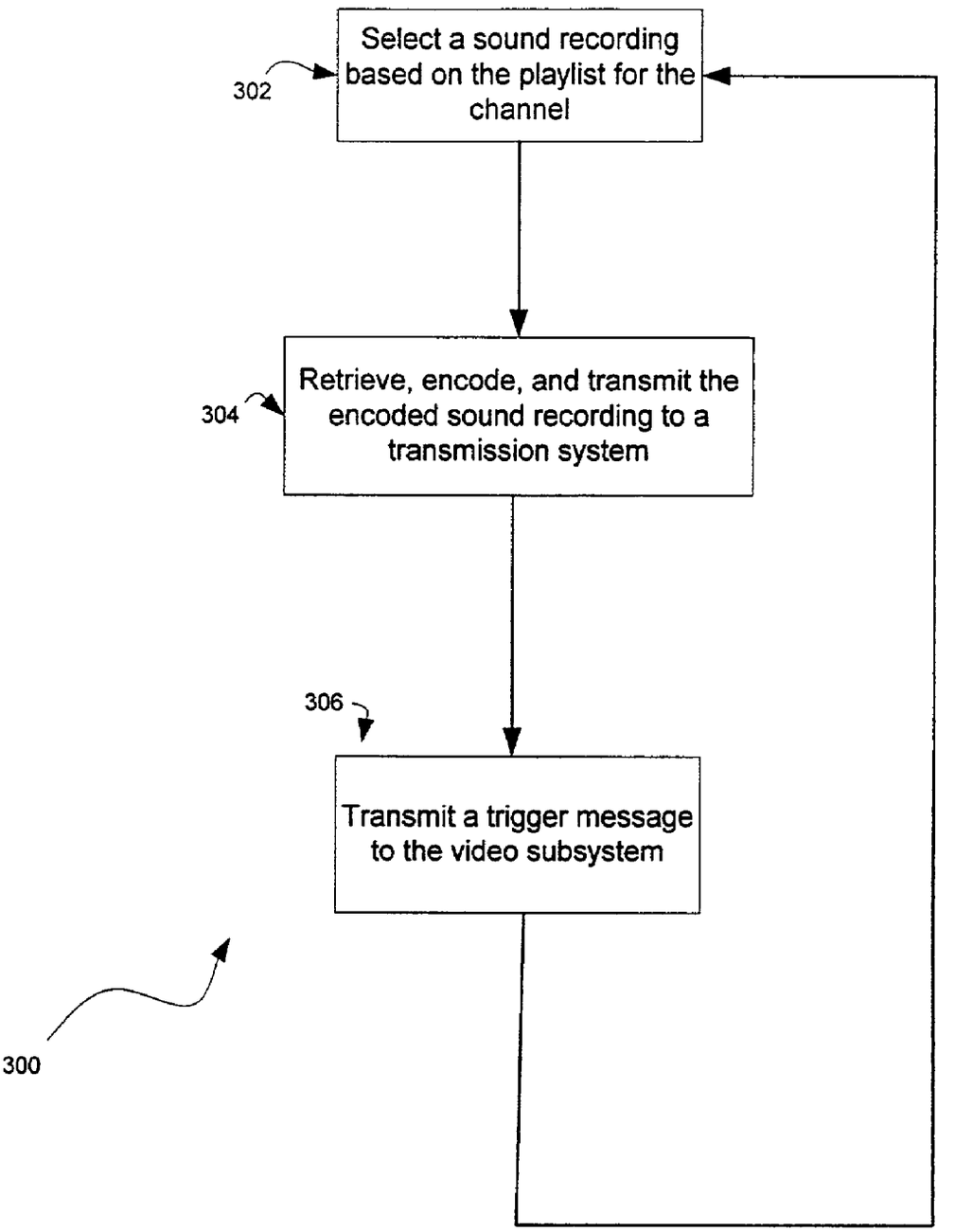
Select a sound recording based on the playlist for the channel
302
Retrieve, encode, and transmit the encoded sound recording to a transmission system
304
306
Transmit a trigger message to the video subsystem
300

FIG. 3A

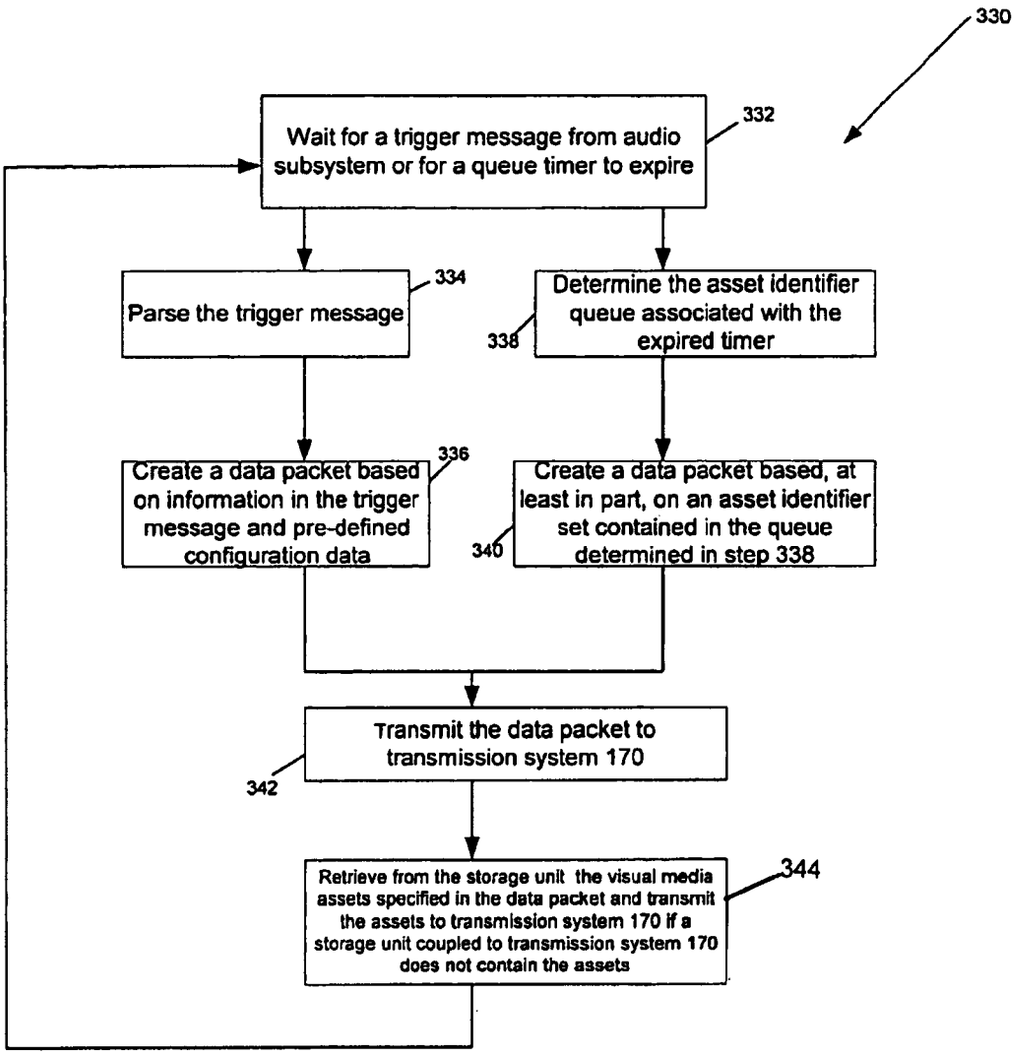
330
Wait for a trigger message from audio subsystem or for a queue timer to expire
332
Parse the trigger message
334
Determine the asset identifier queue associated with the expired timer
338
Create a data packet based on information in the trigger message and pre-defined configuration data
336
Create a data packet based, at least in part, on an asset identifier set contained in the queue determined in step 338
340
Transmit the data packet to transmission system 170
342
Retrieve from the storage unit the visual media assets specified in the data packet and transmit the assets to transmission system 170 if a storage unit coupled to transmission system 170 does not contain the assets
344

FIG. 3B

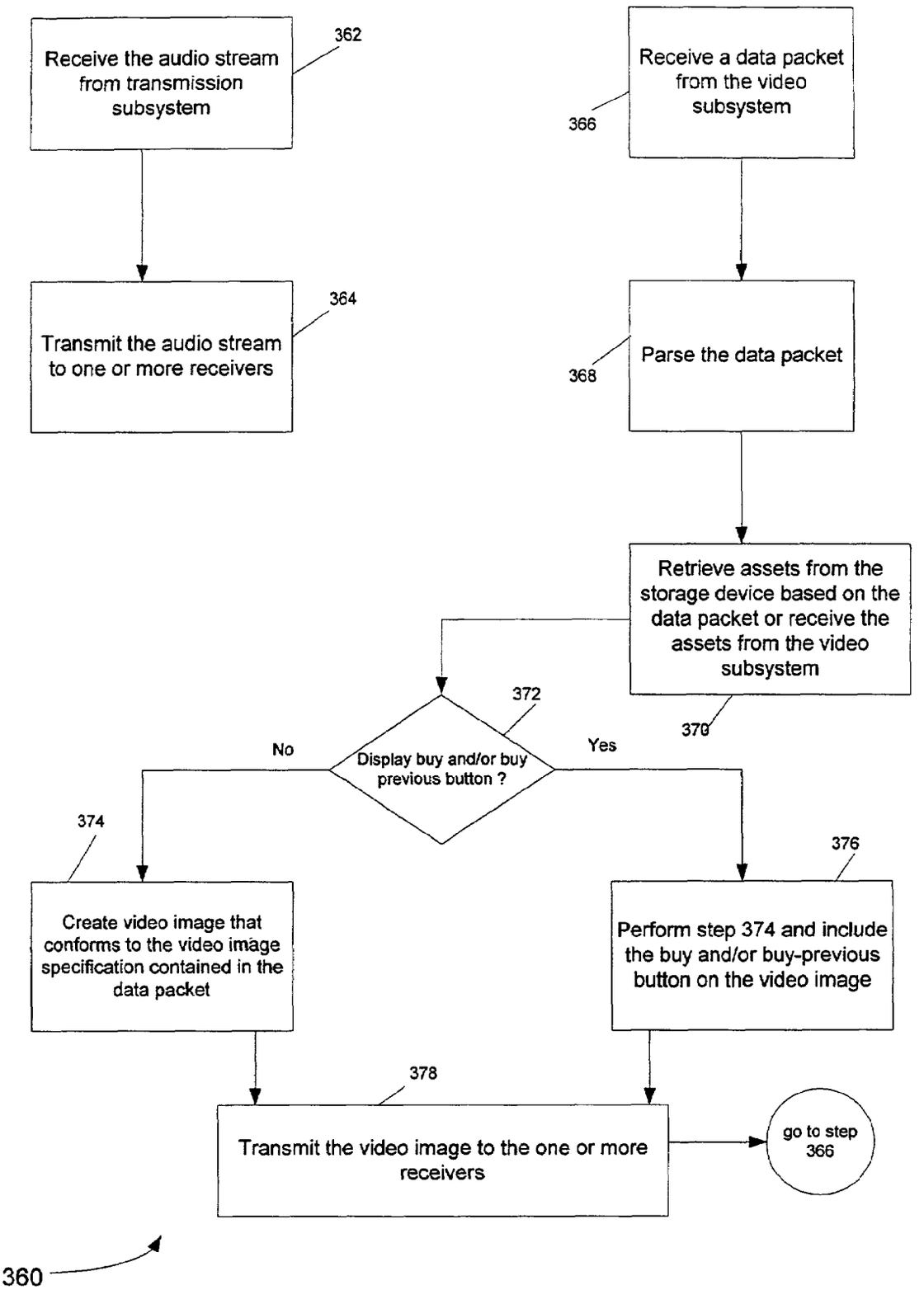
Receive the audio stream from transmission subsystem
362
Transmit the audio stream to one or more receivers
364
Receive a data packet from the video subsystem
366
Parse the data packet
368
Retrieve assets from the storage device based on the data packet or receive the assets from the video subsystem
370
372
Display buy and/or buy previous button ?
No
Yes
374
Create video image that conforms to the video image specification contained in the data packet
376
Perform step 374 and include the buy and/or buy-previous button on the video image
378
Transmit the video image to the one or more receivers
go to step 366
360

FIG. 3C

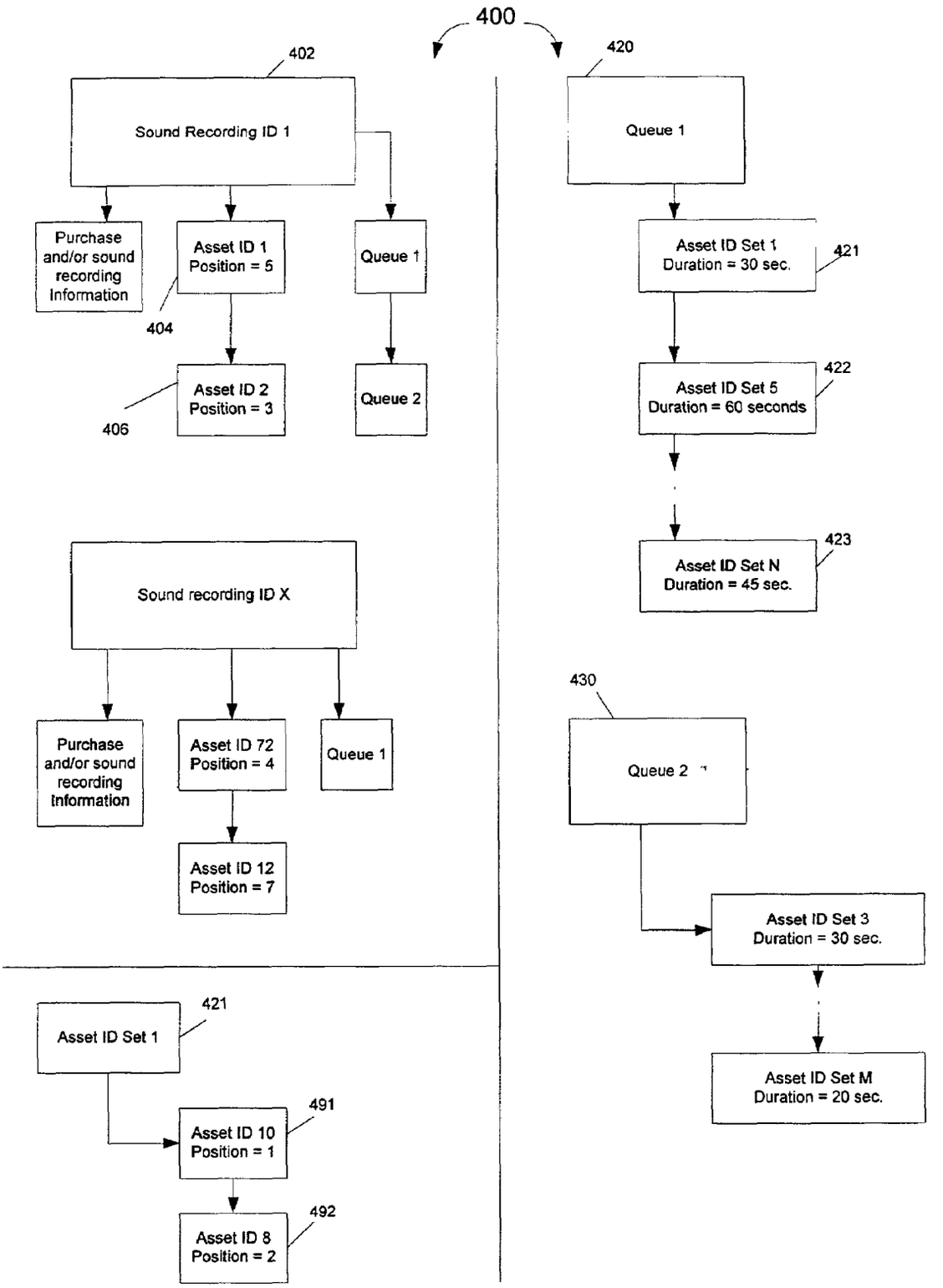
400
402
Sound Recording ID 1
Purchase and/or sound recording Information
Asset ID 1 Position = 5
404
Queue 1
Asset ID 2 Position = 3
406
Queue 2
Sound recording ID X
Purchase and/or sound recording Information
Asset ID 72 Position = 4
Queue 1
Asset ID 12 Position = 7
420
Queue 1
Asset ID Set 1 Duration = 30 sec.
421
Asset ID Set 5 Duration = 60 seconds
422
Asset ID Set N Duration = 45 sec.
423
430
Queue 2
Asset ID Set 3 Duration = 30 sec.
Asset ID Set M Duration = 20 sec.
421
Asset ID Set 1
491
Asset ID 10 Position = 1
492
Asset ID 8 Position = 2

FIG. 4

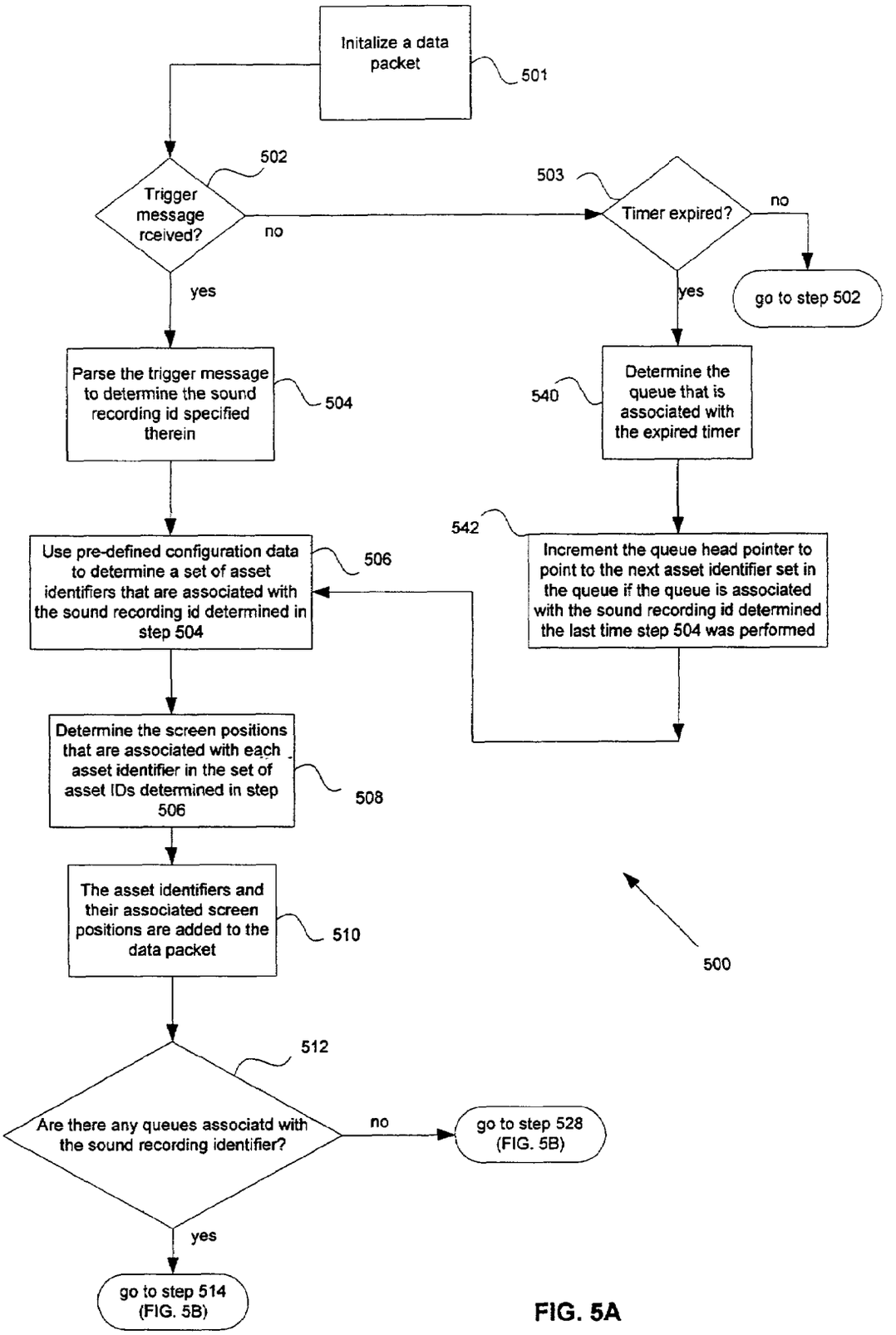
Initalize a data packet
501
502
Trigger message rceived?
no
yes
503
Timer expired?
no
yes
go to step 502
Parse the trigger message to determine the sound recording id specified therein
504
540
Determine the queue that is associated with the expired timer
542
Use pre-defined configuration data to determine a set of asset identifiers that are associated with the sound recording id determined in step 504
506
Increment the queue head pointer to point to the next asset identifier set in the queue if the queue is associated with the sound recording id determined the last time step 504 was performed
Determine the screen positions that are associated with each asset identifier in the set of asset IDs determined in step 506
508
The asset identifiers and their associated screen positions are added to the data packet
510
500
512
Are there any queues associatd with the sound recording identifier?
no
go to step 528 (FIG. 5B)
yes
go to step 514 (FIG. 5B)

FIG. 5A

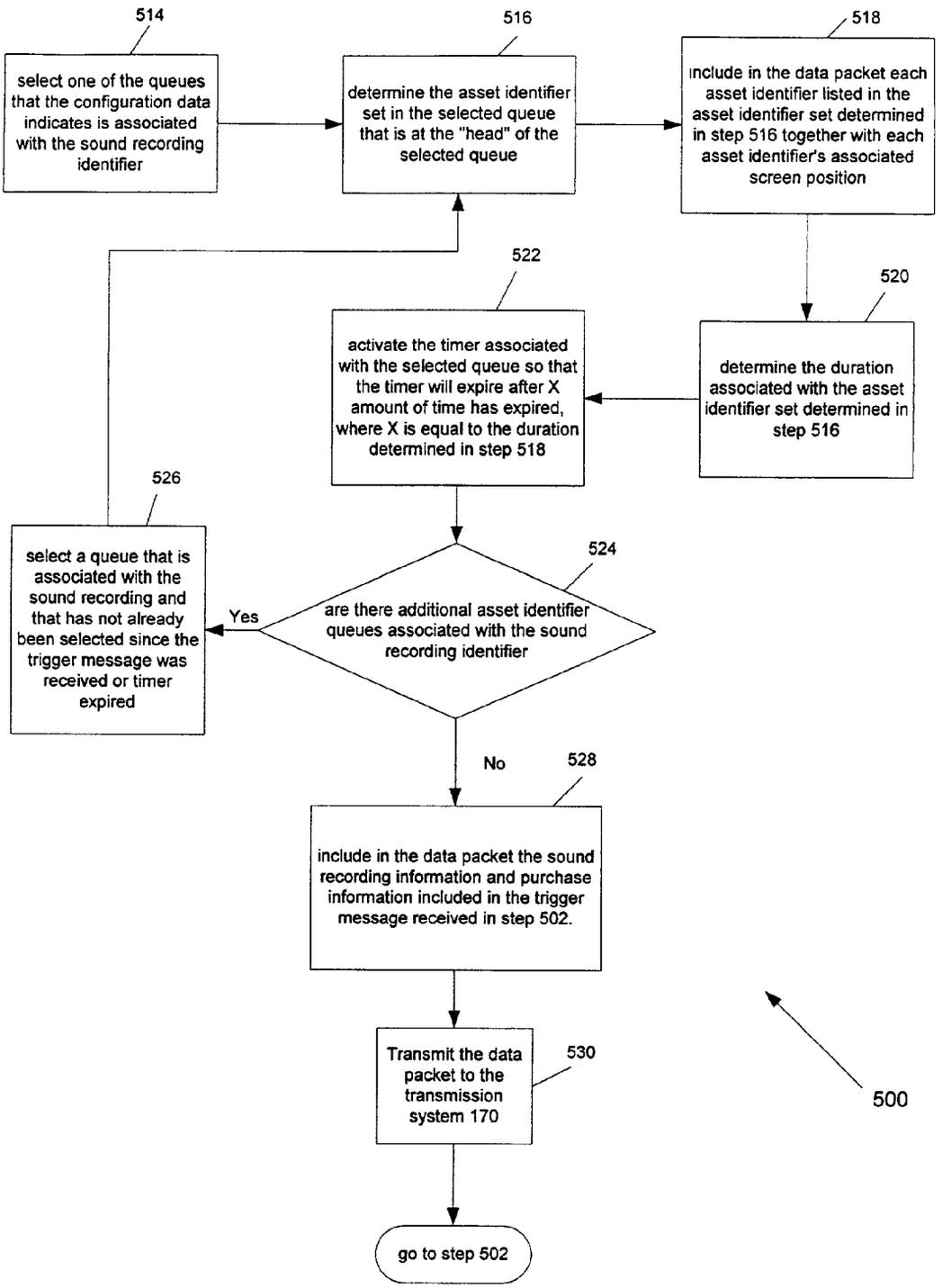
514
select one of the queues that the configuration data indicates is associated with the sound recording identifier
516
determine the asset identifier set in the selected queue that is at the "head" of the selected queue
518
include in the data packet each asset identifier listed in the asset identifier set determined in step 516 together with each asset identifier's associated screen position
520
determine the duration associated with the asset identifier set determined in step 516
522
activate the timer associated with the selected queue so that the timer will expire after X amount of time has expired, where X is equal to the duration determined in step 518
524
are there additional asset identifier queues associated with the sound recording identifier
Yes
526
select a queue that is associated with the sound recording and that has not already been selected since the trigger message was received or timer expired
No
528
include in the data packet the sound recording information and purchase information included in the trigger message received in step 502.
Transmit the data packet to the transmission system 170
530
go to step 502
500

FIG. 5B

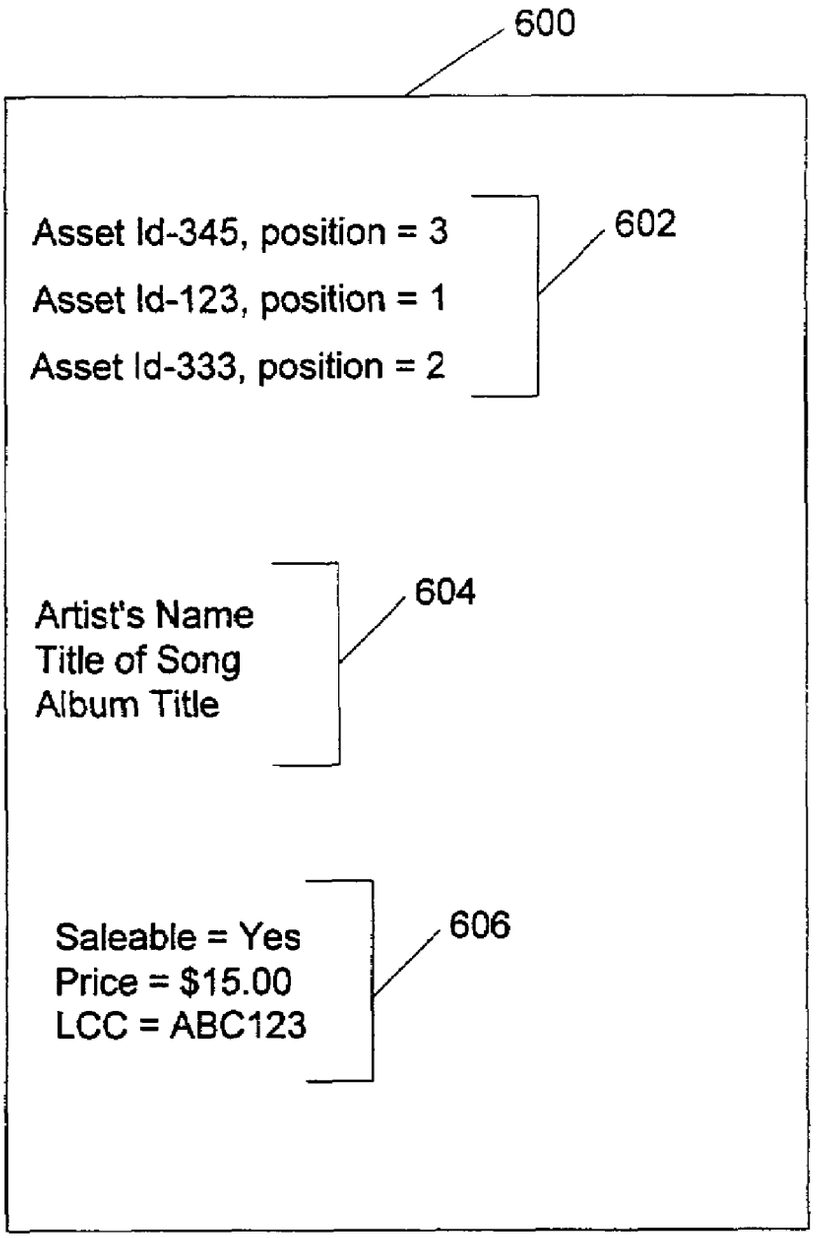
600
Asset Id-345, position = 3
Asset Id-123, position = 1
Asset Id-333, position = 2
602
Artist's Name
Title of Song
Album Title
604
Saleable = Yes
Price = $15.00
LCC = ABC123
606

FIG. 6

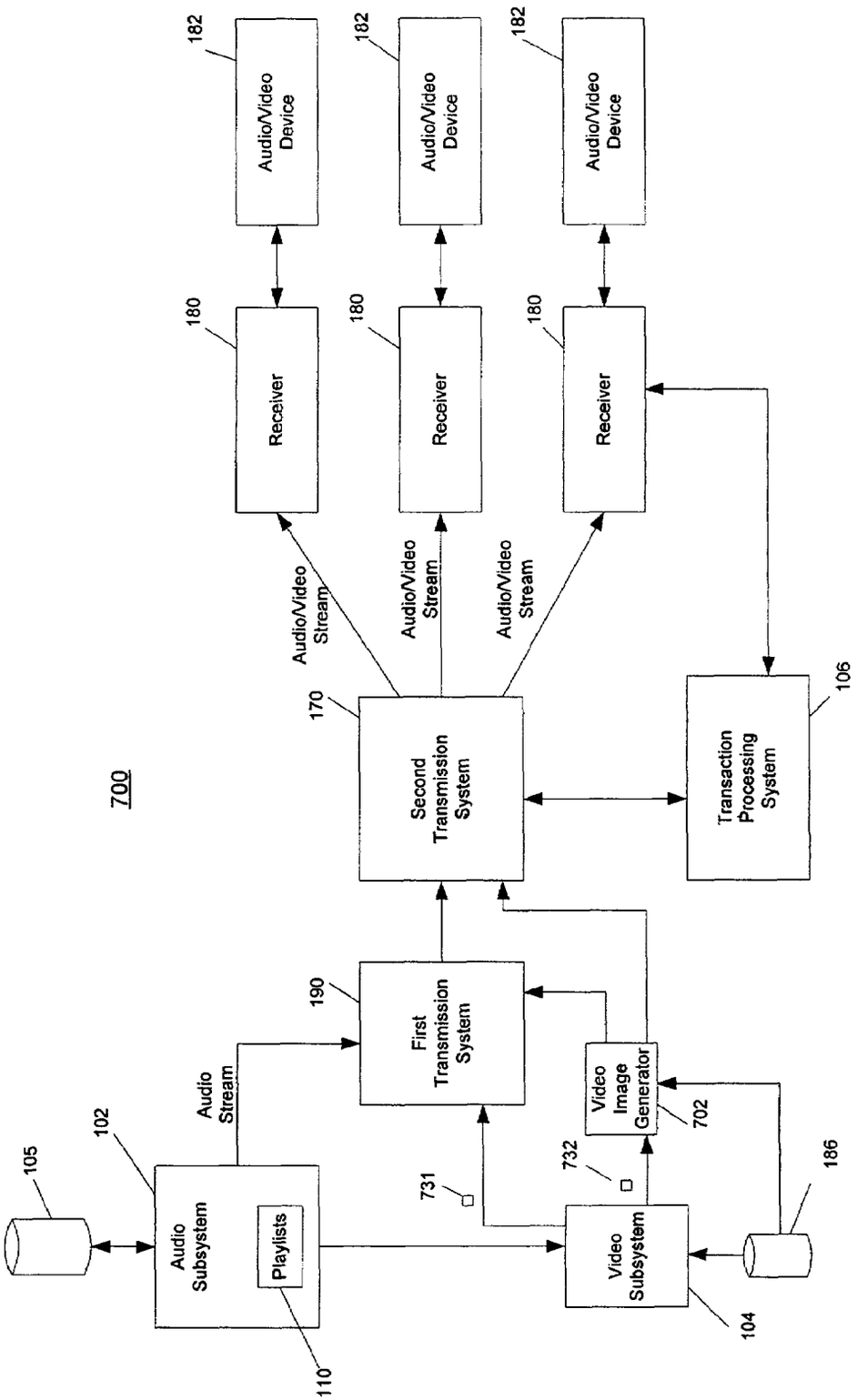
700
182
Audio/Video Device
180
Receiver
Audio/Video Stream
170
Second Transmission System
106
Transaction Processing System
190
First Transmission System
Audio Stream
102
105
Audio Subsystem
Playlists
110
731
732
Video Image Generator
702
Video Subsystem
104
186

FIG. 7

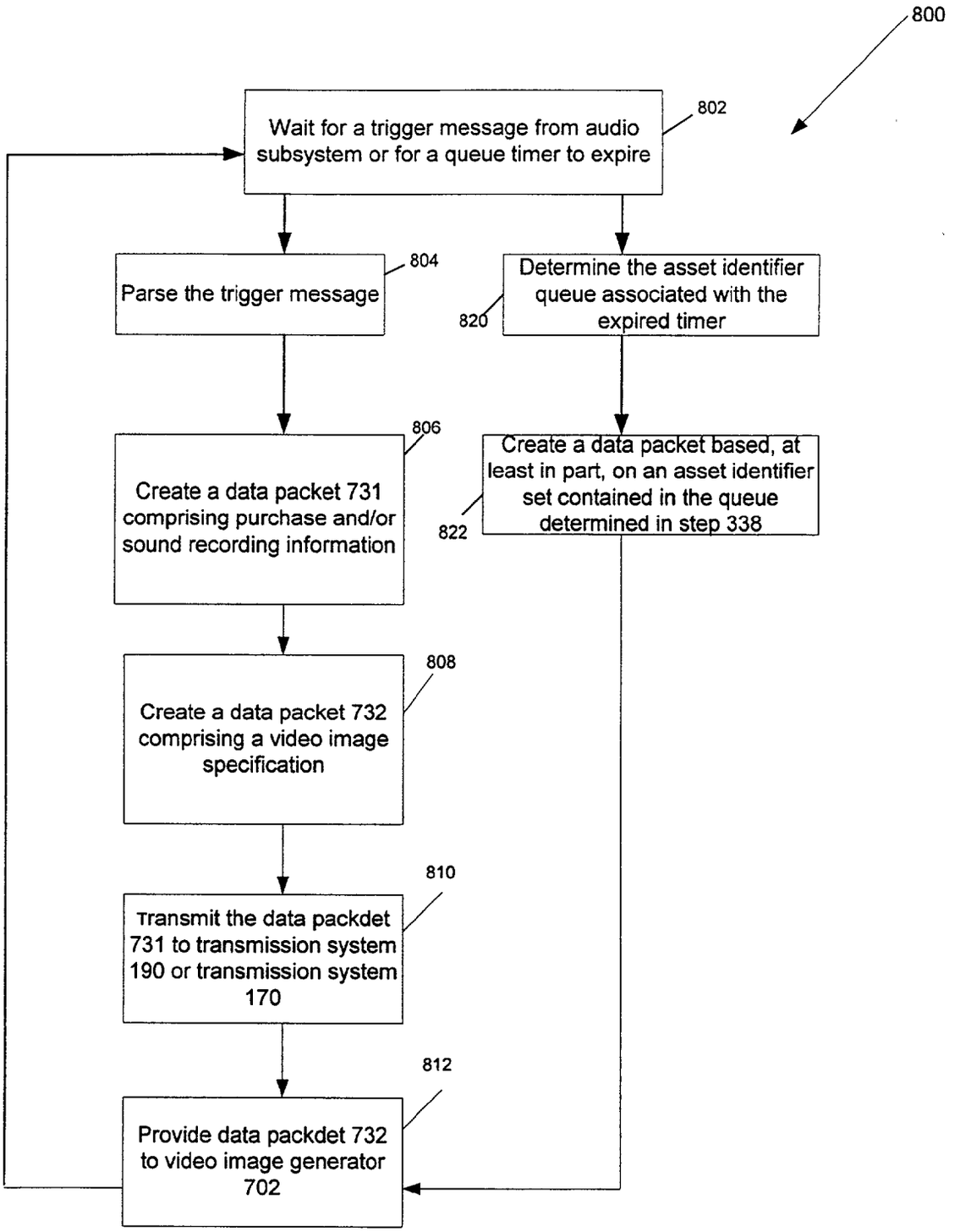
800
Wait for a trigger message from audio subsystem or for a queue timer to expire
802
Parse the trigger message
804
Determine the asset identifier queue associated with the expired timer
820
Create a data packet 731 comprising purchase and/or sound recording information
806
Create a data packet based, at least in part, on an asset identifier set contained in the queue determined in step 338
822
Create a data packet 732 comprising a video image specification
808
Transmit the data packdet 731 to transmission system 190 or transmission system 170
810
Provide data packdet 732 to video image generator 702
812

FIG. 8

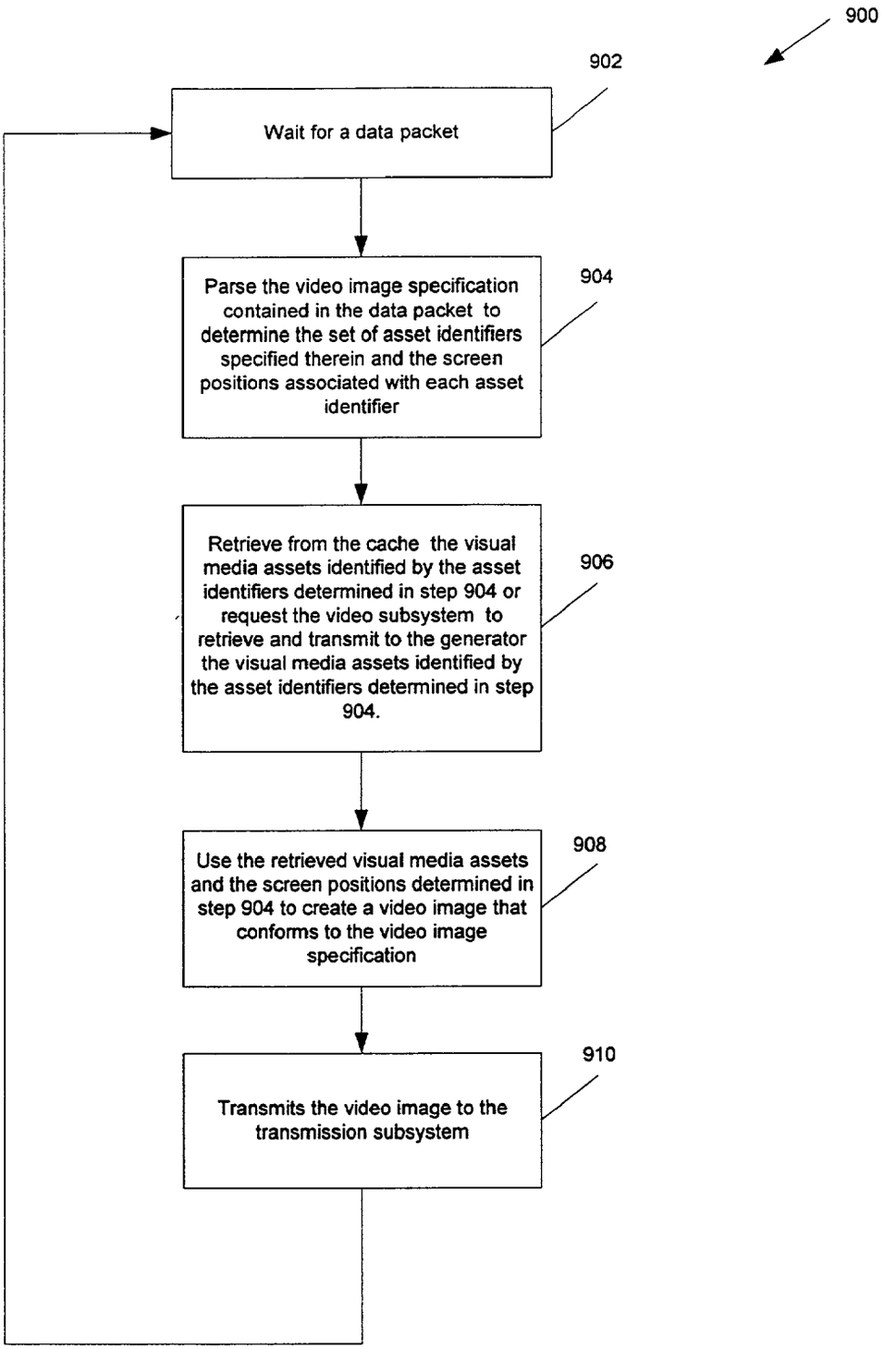
900
902
Wait for a data packet
904
Parse the video image specification contained in the data packet to determine the set of asset identifiers specified therein and the screen positions associated with each asset identifier
906
Retrieve from the cache the visual media assets identified by the asset identifiers determined in step 904 or request the video subsystem to retrieve and transmit to the generator the visual media assets identified by the asset identifiers determined in step 904.
908
Use the retrieved visual media assets and the screen positions determined in step 904 to create a video image that conforms to the video image specification
910
Transmits the video image to the transmission subsystem

FIG. 9

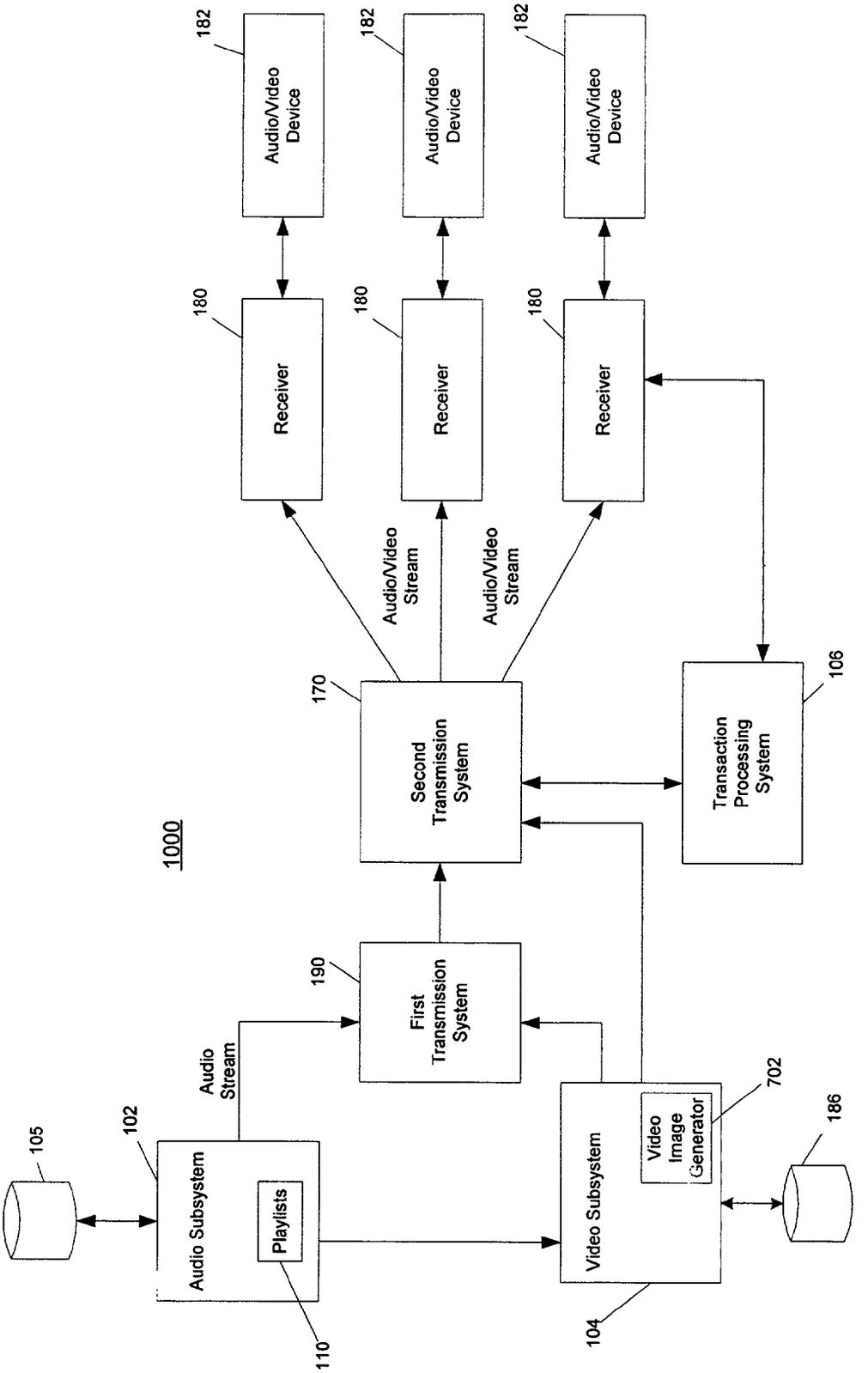
1000
182
Audio/Video Device
180
Receiver
Audio/Video Stream
170
Second Transmission System
106
Transaction Processing System
190
First Transmission System
Audio Stream
102
Audio Subsystem
Playlists
110
105
Video Subsystem
Video Image Generator
702
186
104

FIG. 10

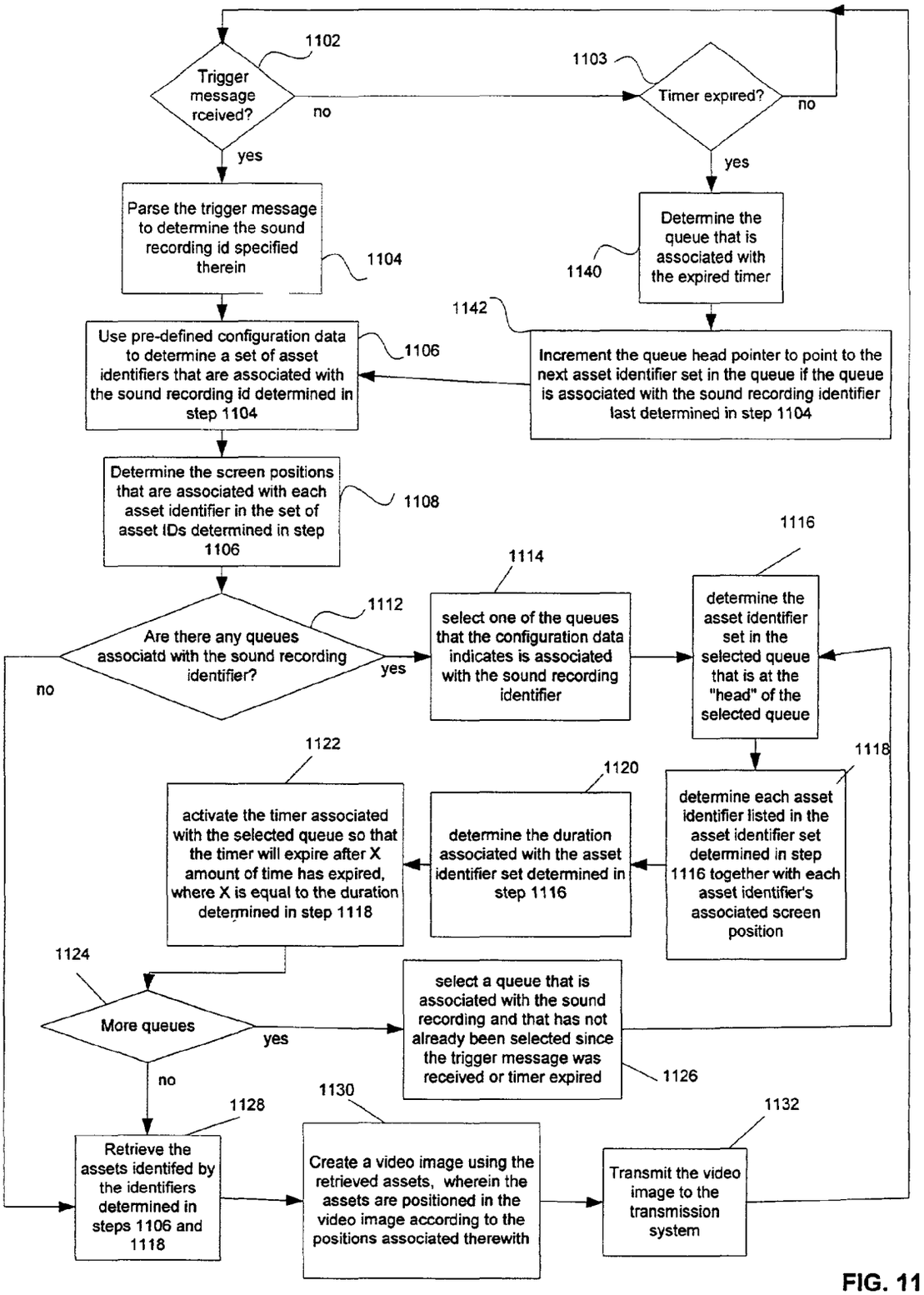
1102
Trigger message received?
no
yes
1103
Timer expired?
no
yes
Parse the trigger message to determine the sound recording id specified therein
1104
Determine the queue that is associated with the expired timer
1140
1142
Use pre-defined configuration data to determine a set of asset identifiers that are associated with the sound recording id determined in step 1104
1106
Increment the queue head pointer to point to the next asset identifier set in the queue if the queue is associated with the sound recording identifier last determined in step 1104
Determine the screen positions that are associated with each asset identifier in the set of asset IDs determined in step 1106
1108
1116
1114
1112
Are there any queues associatd with the sound recording identifier?
yes
no
select one of the queues that the configuration data indicates is associated with the sound recording identifier
determine the asset identifier set in the selected queue that is at the "head" of the selected queue
1122
1120
1118
activate the timer associated with the selected queue so that the timer will expire after X amount of time has expired, where X is equal to the duration determined in step 1118
determine the duration associated with the asset identifier set determined in step 1116
determine each asset identifier listed in the asset identifier set determined in step 1116 together with each asset identifier's associated screen position
1124
More queues
yes
no
select a queue that is associated with the sound recording and that has not already been selected since the trigger message was received or timer expired
1126
1130
1128
1132
Retrieve the assets identifed by the identifiers determined in steps 1106 and 1118
Create a video image using the retrieved assets, wherein the assets are positioned in the video image according to the positions associated therewith
Transmit the video image to the transmission system

FIG. 11

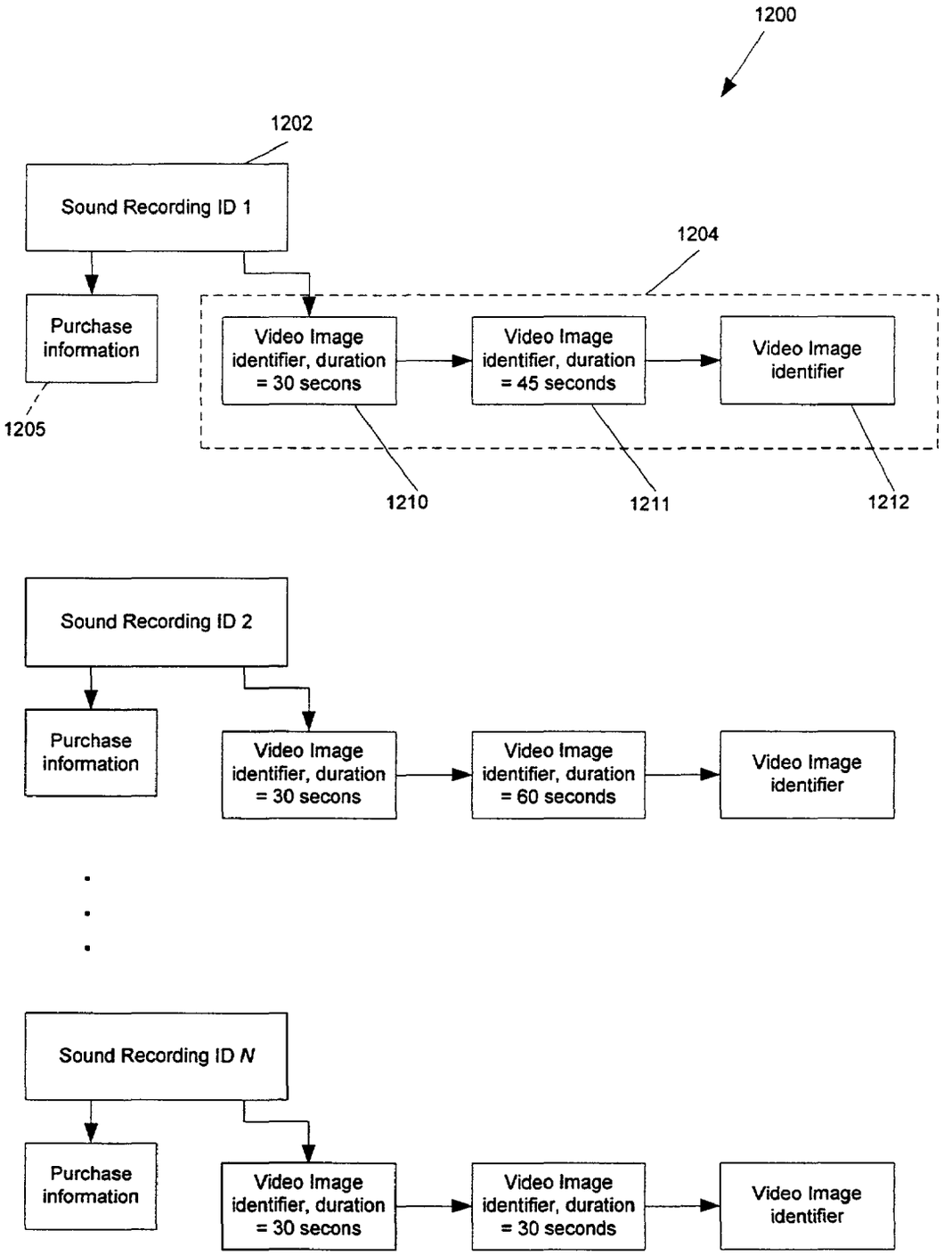
1200
1202
Sound Recording ID 1
1204
Purchase information
Video Image identifier, duration = 30 secons
Video Image identifier, duration = 45 seconds
Video Image identifier
1205
1210
1211
1212
Sound Recording ID 2
Purchase information
Video Image identifier, duration = 30 secons
Video Image identifier, duration = 60 seconds
Video Image identifier
Sound Recording ID N
Purchase information
Video Image identifier, duration = 30 secons
Video Image identifier, duration = 30 seconds
Video Image identifier

FIG. 12

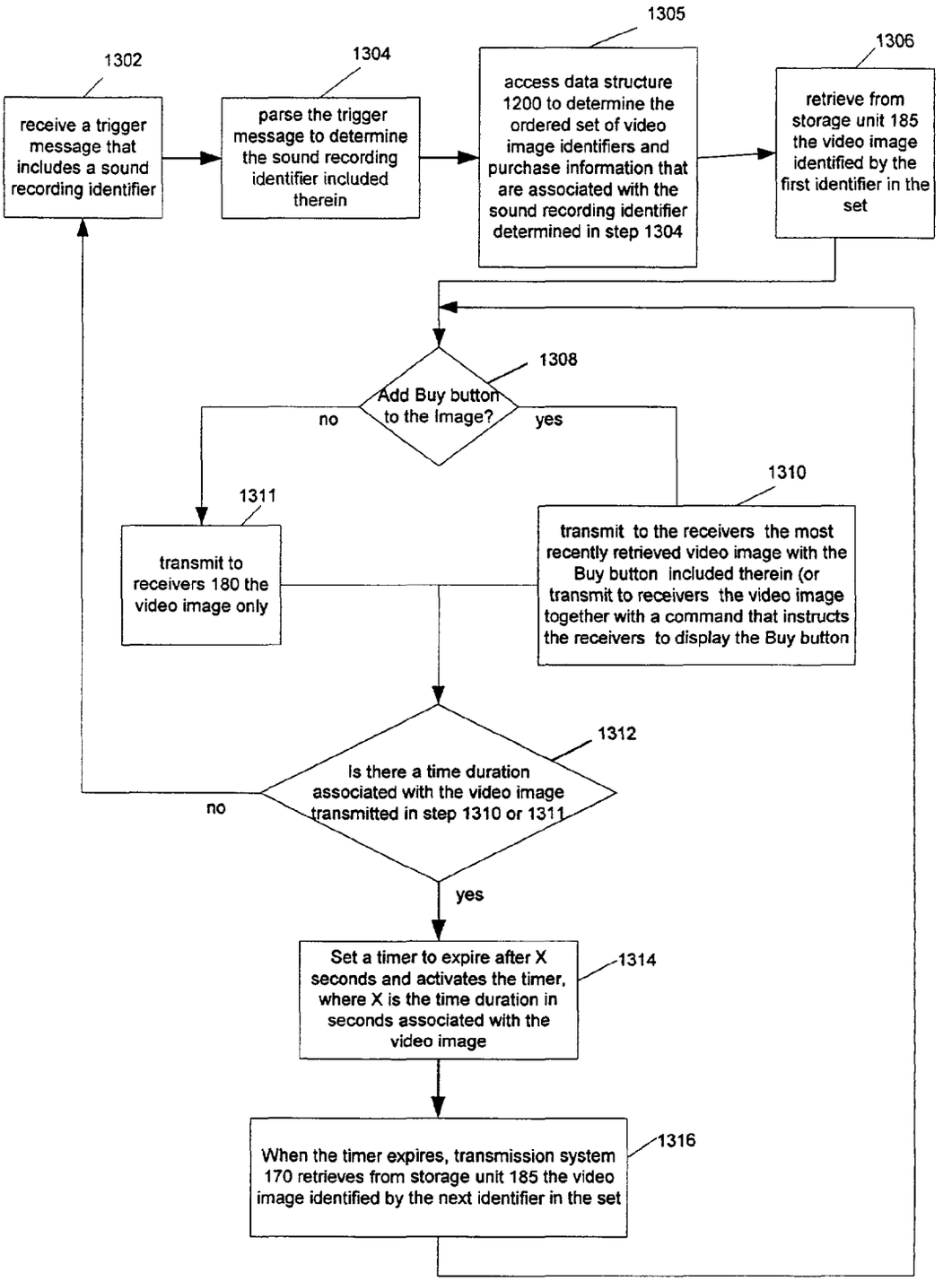
1302
receive a trigger message that includes a sound recording identifier
1304
parse the trigger message to determine the sound recording identifier included therein
1305
access data structure 1200 to determine the ordered set of video image identifiers and purchase information that are associated with the sound recording identifier determined in step 1304
1306
retrieve from storage unit 185 the video image identified by the first identifier in the set
1308
Add Buy button to the Image?
no
yes
1311
transmit to receivers 180 the video image only
1310
transmit to the receivers the most recently retrieved video image with the Buy button included therein (or transmit to receivers the video image together with a command that instructs the receivers to display the Buy button
1312
Is there a time duration associated with the video image transmitted in step 1310 or 1311
no
yes
1314
Set a timer to expire after X seconds and activates the timer, where X is the time duration in seconds associated with the video image
1316
When the timer expires, transmission system 170 retrieves from storage unit 185 the video image identified by the next identifier in the set

FIG. 13

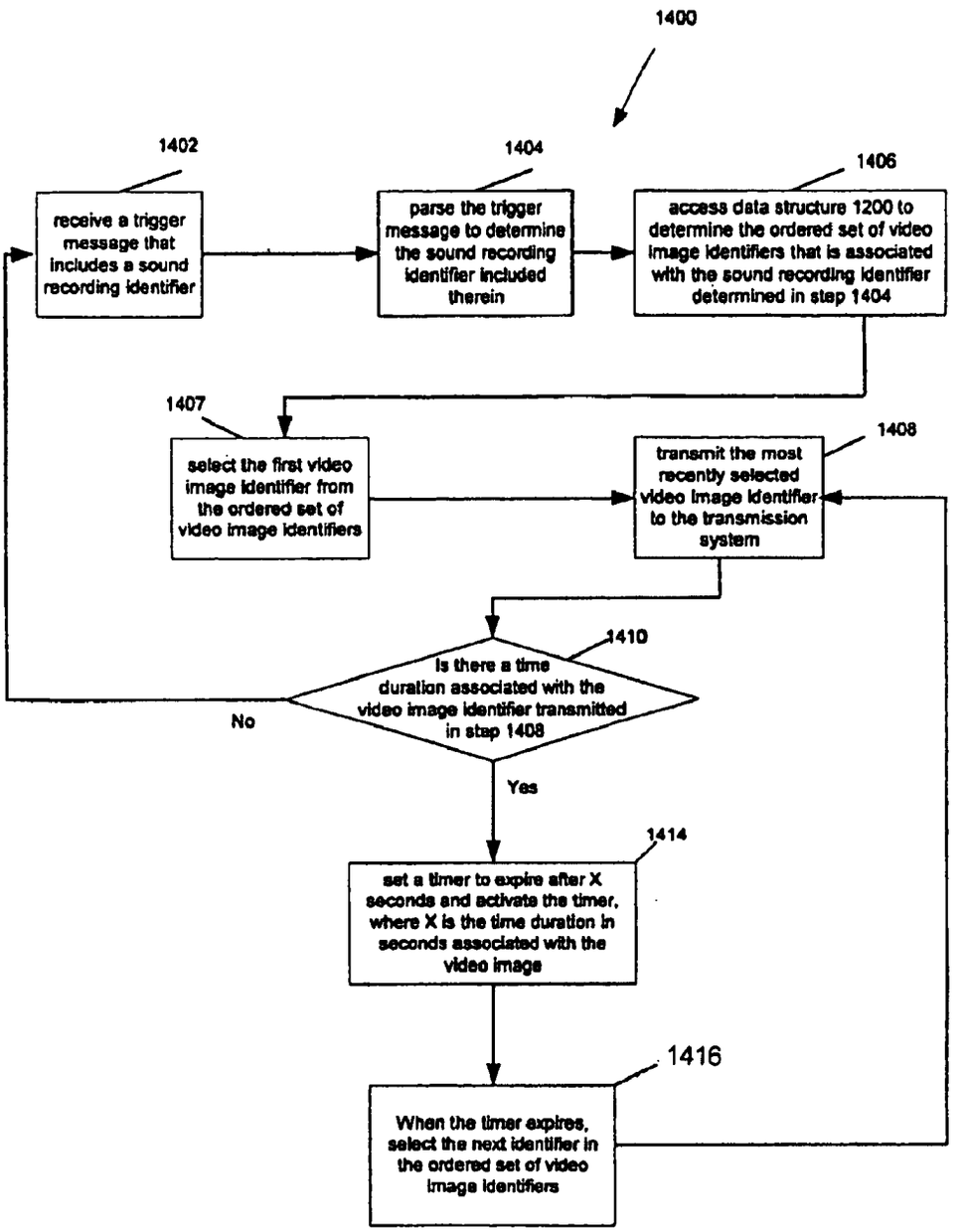
1400
1402
receive a trigger message that includes a sound recording identifier
1404
parse the trigger message to determine the sound recording identifier included therein
1406
access data structure 1200 to determine the ordered set of video image identifiers that is associated with the sound recording identifier determined in step 1404
1407
select the first video image identifier from the ordered set of video image identifiers
1408
transmit the most recently selected video image identifier to the transmission system
1410
Is there a time duration associated with the video image identifier transmitted in step 1408
No
Yes
1414
set a timer to expire after X seconds and activate the timer, where X is the time duration in seconds associated with the video image
1416
When the timer expires, select the next identifier in the ordered set of video image identifiers

FIG. 14A

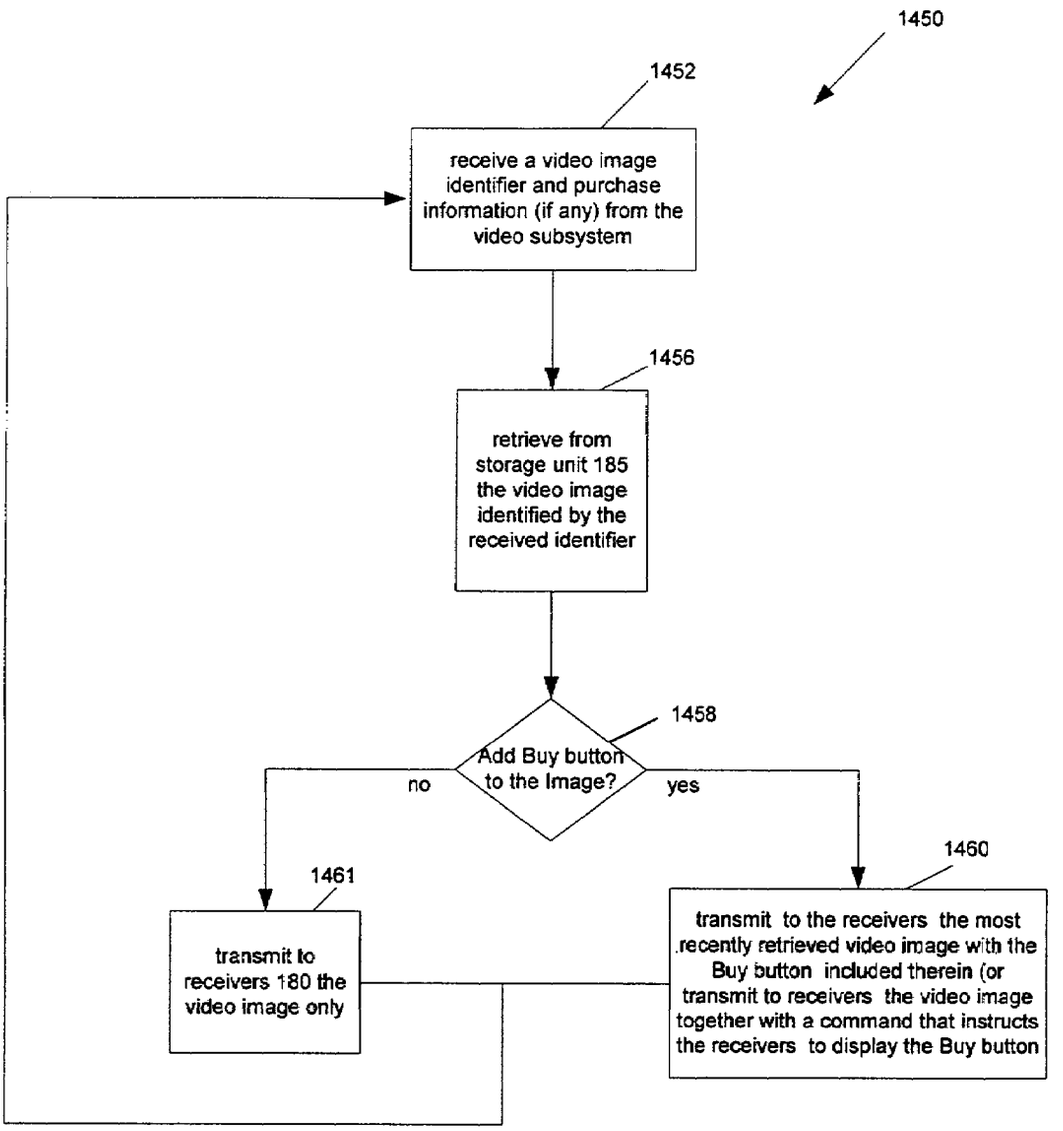
1450
1452
receive a video image identifier and purchase information (if any) from the video subsystem
1456
retrieve from storage unit 185 the video image identified by the received identifier
1458
Add Buy button to the Image?
no
yes
1461
transmit to receivers 180 the video image only
1460
transmit to the receivers the most recently retrieved video image with the Buy button included therein (or transmit to receivers the video image together with a command that instructs the receivers to display the Buy button

FIG. 14B

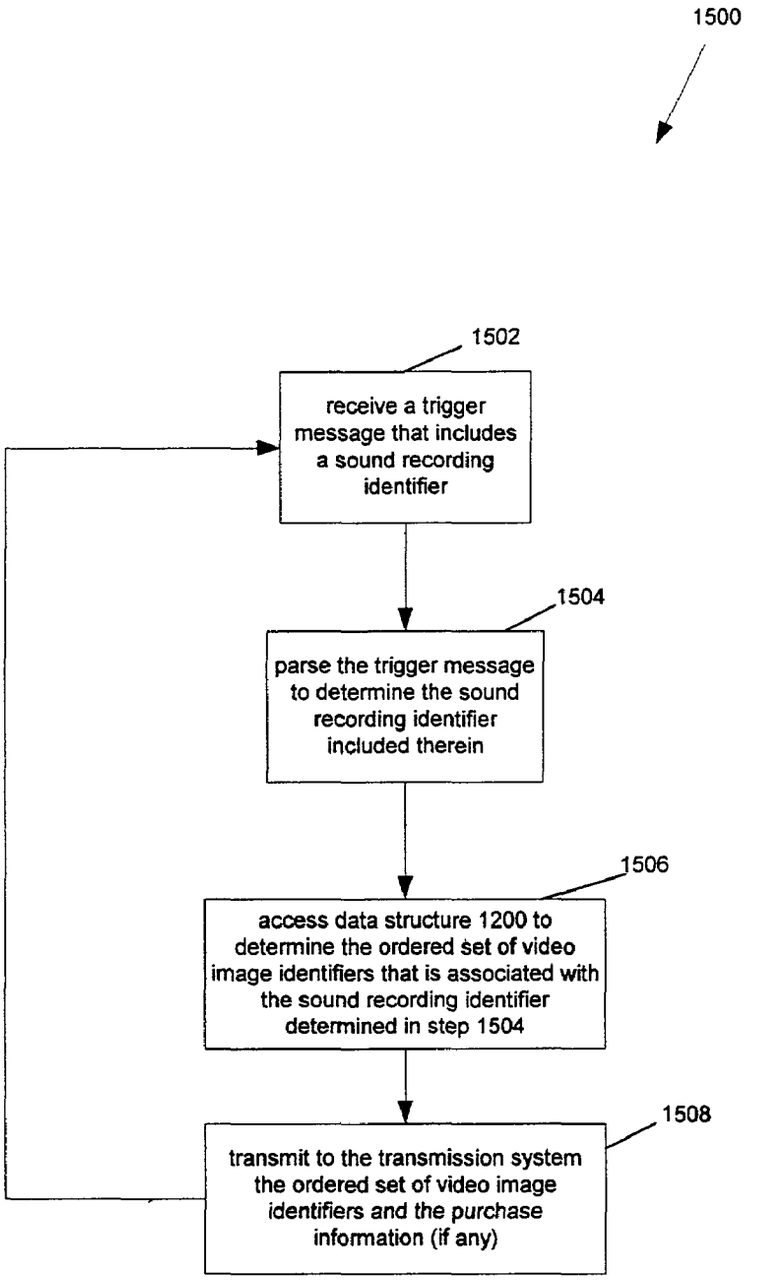
1500
1502
receive a trigger message that includes a sound recording identifier
1504
parse the trigger message to determine the sound recording identifier included therein
1506
access data structure 1200 to determine the ordered set of video image identifiers that is associated with the sound recording identifier determined in step 1504
1508
transmit to the transmission system the ordered set of video image identifiers and the purchase information (if any)

FIG. 15A

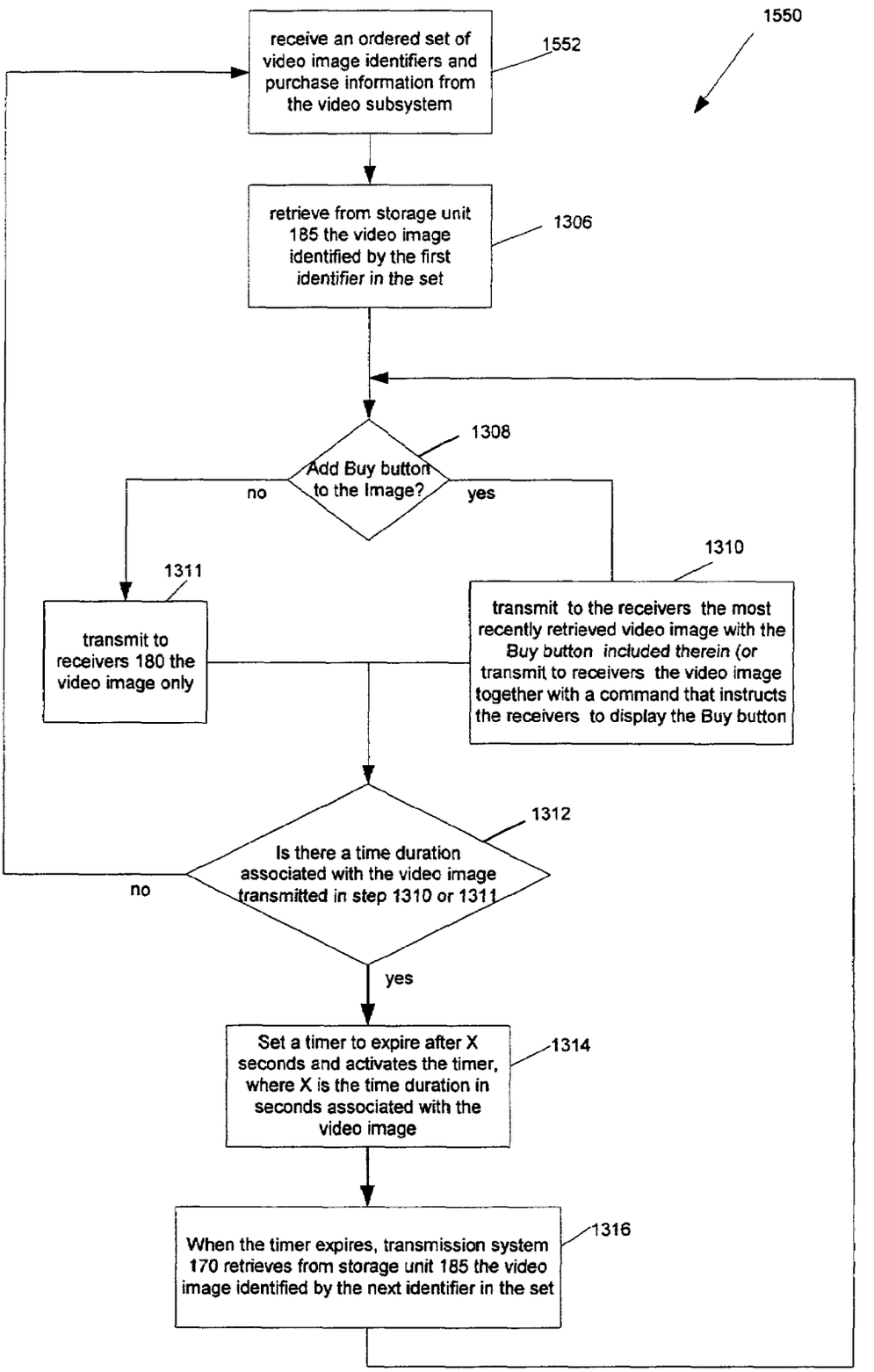
1550
receive an ordered set of video image identifiers and purchase information from the video subsystem
1552
retrieve from storage unit 185 the video image identified by the first identifier in the set
1306
Add Buy button to the Image?
1308
no
yes
1311
transmit to receivers 180 the video image only
1310
transmit to the receivers the most recently retrieved video image with the Buy button included therein (or transmit to receivers the video image together with a command that instructs the receivers to display the Buy button
Is there a time duration associated with the video image transmitted in step 1310 or 1311
1312
no
yes
Set a timer to expire after X seconds and activates the timer, where X is the time duration in seconds associated with the video image
1314
When the timer expires, transmission system 170 retrieves from storage unit 185 the video image identified by the next identifier in the set
1316

FIG. 15B

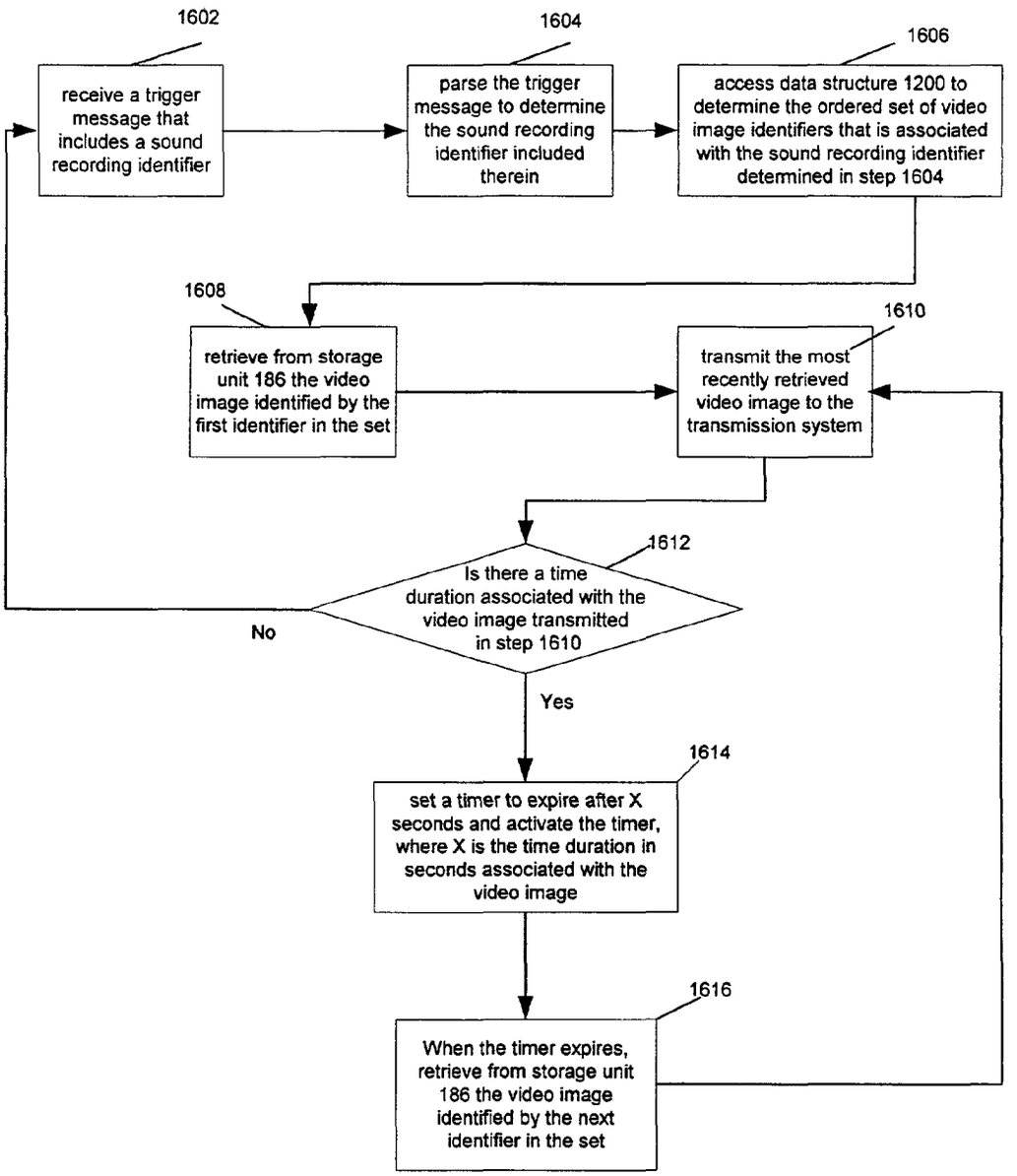
1602
receive a trigger message that includes a sound recording identifier
1604
parse the trigger message to determine the sound recording identifier included therein
1606
access data structure 1200 to determine the ordered set of video image identifiers that is associated with the sound recording identifier determined in step 1604
1608
retrieve from storage unit 186 the video image identified by the first identifier in the set
1610
transmit the most recently retrieved video image to the transmission system
1612
Is there a time duration associated with the video image transmitted in step 1610
No
Yes
1614
set a timer to expire after X seconds and activate the timer, where X is the time duration in seconds associated with the video image
1616
When the timer expires, retrieve from storage unit 186 the video image identified by the next identifier in the set

FIG. 16

SYSTEM AND METHOD FOR PROVIDING AN INTERACTIVE, VISUAL COMPLEMENT TO AN AUDIO PROGRAM

This application claims the benefit of U.S. Provisional Patent Application 60/315,046, filed on Aug. 28, 2001.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention is generally related to audio services, and, more specifically, provides an interactive, visual complement to one or more audio programs.

2. Discussion of the Background

Presently, there exist systems that broadcast music via satellite and cable to consumers' televisions or set-top boxes or other broadcast receiving devices. Within such a system, a consumer has typically a selection of 45 music channels to choose from. The channels comprise a variety of music genres and formats. Conventionally, for each of the available music channels, the system broadcasts audio only or, at most, a few lines of text in addition to the audio. This additional text is displayed on the consumer's TV screen. On any given channel, the text typically includes information about the music that is currently playing on that channel, such as the name of the artist, the title of the song, and the title of an album that contains the song.

Because only a few lines of text, at most, are transmitted with the audio, a consumer who tunes his or her TV or set-top box to one of the music channels sees an almost entirely blank TV screen. Thus, in conventional broadcast music systems, the TV screen is underutilized and the consumer's overall enjoyment of the system is limited.

What is desired, therefore, is a system to overcome this and other disadvantages of conventional music systems.

SUMMARY OF THE INVENTION

The present invention overcomes the above described disadvantage by providing a system and method for providing a visual complement to one or more audio programs. In one aspect, the system includes an audio subsystem for selecting a sound recording based on a playlist, generating an audio signal corresponding to the sound recording, and transmitting triggers to a video subsystem whenever a sound recording is selected. Upon receiving a trigger from the audio subsystem, the video subsystem generates a video image specification based, at least in part, on the selected sound recording. The audio signal and video image specification are transmitted to an audio/video signal transmission system. The transmission system receives the video image specification and generates a video image that conforms to the video image specification. The transmission system then transmits the video image and the audio signal to consumers' audio/video receivers so that the audio signal and video image may be perceived by the consumers. In this way, the system provides a visual complement to an audio service.

In one embodiment, the audio/video signal transmission system is a broadcast transmission system that broadcasts the video image and the audio signal to the consumers' audio/video receivers.

Advantageously, the invention may also provide an interactive, visual complement to the audio program. In this embodiment, the transmission system adds one or more selectable, interactive buttons to the video image depending on information received from the video subsystem.

In another aspect, the system also includes a video image generator coupled to the video subsystem. In this aspect, the video image specification generated by the video subsystem in response to the trigger received from the audio subsystem is provided to the video image generator. The video image generator then generates a video image based on the provided video image specification and transmits the video image to a first transmission subsystem. At the same time this is occurring, audio subsystem transmits the audio signal corresponding to the selected sound recording to the first transmission subsystem. The first transmission subsystem then transmits the audio signal together with the video image to a second transmission system, which then transmits the audio signal and video image to the consumers' receivers so that when a consumer tunes his receiver to the particular channel the consumer will be able to hear the sound recording and view the video image.

Advantageously, the video image is updated at various times so that the video image seen by the consumer changes over time as well as changing whenever a new sound recording is selected and played by the audio subsystem.

In one particular aspect, the video subsystem generates an HTML document that contains the video image specification and provides the HTML document to the video image generator. The video image generator uses the HTML document to generate an MPEG video presentation.

In another aspect, the video images are pre-generated. The pre-generated video images may be stored at the audio/video system or at the transmission system. Advantageously, a data structure is used to associate a set of one or more of the pre-generated video images with one or more sound recordings from a playlist.

Further features and advantages of the present invention, as well as the structure and operation of various embodiments of the present invention, are described in detail below with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated herein and form part of the specification, illustrate various embodiments of the present invention and, together with the description, further serve to explain the principles of the invention and to enable a person skilled in the pertinent art to make and use the invention. In the drawings, like reference numbers indicate identical or functionally similar elements. Additionally, the left-most digit(s) of a reference number identifies the drawing in which the reference number first appears.

FIG. **1** is a block diagram of one embodiment of an audio/video system for providing audio/video programming to consumers.

FIG. **2** illustrates various locations on a TV screen where visual media assets may be displayed.

FIGS. **3**A-**3**C are flow charts illustrating processes, according to one embodiment, performed by the audio subsystem, the video subsystem, and the audio/video signal transmission system, respectively, for providing an interactive, visual complement to an audio program for a particular channel.

FIG. **4** illustrates pre-defined configuration data that is associated with a particular channel and that is used by the video subsystem to create data packets for the particular channel.

FIGS. **5**A and **5**B is a flow chart illustrating a process, according to one embodiment, for creating a data packet for a particular channel.

FIG. **6** illustrates an exemplary data packet.

FIG. **7** is a block diagram of a system according to another embodiment of the invention.

FIG. **8** is a flow chart illustrating a process, according to another embodiment, that is performed by the video subsystem.

FIG. **9** is a flow chart illustrating a process, according to one embodiment, that is performed by the video image generator.

FIG. **10** is a block diagram of a system according to another embodiment of the invention.

FIG. **11** is a flow chart illustrating a process, according to one embodiment, that is performed by the video subsystem.

FIG. **12** illustrates an exemplary data structure that associates sound recording identifiers from a playlist with a set of one or more video image identifiers.

FIG. **13** is a flow chart illustrating a process, according to one embodiment, that is performed by the audio/video signal transmission system **170** when the video images are pre-generated.

FIG. **14**A is a flow chart illustrating a process, according to one embodiment, that is performed by the video subsystem when the video images are pre-generated.

FIG. **14**B is a flow chart illustrating a process, according to another embodiment, that is performed by the audio/video signal transmission system when the video images are pre-generated.

FIG. **15**A is a flow chart illustrating a process, according to another embodiment, that is performed by the video subsystem when the video images are pre-generated.

FIG. **15**B is a flow chart illustrating a process, according to another embodiment, that is performed by the audio/video signal transmission system when the video images are pre-generated.

FIG. **16** is a flow chart illustrating a process, according to another embodiment, that is performed by the video subsystem when the video images are pre-generated.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. **1** is a block diagram of one embodiment of a system **100** for providing audio/video programming. System **100** includes an audio/video system **101** comprising an audio subsystem **102** that provides audio content for transmission to listeners over one or more channels and a video subsystem **104** for providing video content that is transmitted together with the audio content and that complements the audio content. System **100** further includes a transaction processing subsystem **106** for processing transactions, such as electronic commerce ("e-commerce") transactions.

Audio/video system **101** may comprise a data processing system, a persistent storage device, and volatile memory. Stored in the storage device and/or the volatile memory are computer instructions (i.e., software) that enable audio/video system **101** to perform the functions and processes described herein. Audio subsystem **102** and video subsystem **104** may be implemented in software or a combination of software and hardware.

Audio subsystem **102** has access to a sound recording library **105** that includes a large number of sound recordings (e.g., tracks from albums of many different genres). The sound recordings may be stored on compact discs, hard disks, or other media for storing data.

Audio subsystem **102** preferably includes a playlist **110** for each of the one or more channels supported by system **100**. A playlist **110** for a particular channel specifies sound recordings that have been programmed for transmission to the listeners of system **100** over that channel during a given period of time. A new playlist **110** is typically generated for each channel on some periodic basis (e.g., daily, weekly, etc.).

Audio subsystem **102** typically retrieves, encodes, and streams the sound recordings to consumers in the order in which the sound recordings are listed in the playlists **110**. Preferably, the sound recordings are encoded by audio subsystem **102** according to the Dolby AC-3 coding technique.

Audio subsystem **102** may stream the encoded sound recordings to a transmission subsystem **190**, which may transmit the encoded sound recordings to an audio/video signal transmission system **170**. Transmission system **170** may be a broadcast transmission system, such as a cable head-end or a direct broadcast satellite system. Transmission system **170** comprises a transmitter (not shown) for transmitting signals and a computer (not shown) programmed to perform processes described herein.

Transmission system **170** transmits the encoded sound recordings to audio/video receivers **180**, which are coupled to an audio/video device **182** that reproduces the sound recordings for the subscribers. Receivers **180** may be conventional digital cable or satellite set-top boxes. Audio/video device **182** may comprise a TV screen or monitor and speakers.

Video subsystem **104**, in one embodiment, is responsible for, among other things, generating, in real time, data packets for each of the one or more channels. A data packet for a particular channel comprises a video image specification that specifies a visual complement of the audio service for the particular channel. Thus, the video image specification defines how the listeners' TV screens will look when the listener tunes to the particular channel.

More specifically, the video image specification specifies one or more visual media asset identifiers, each of which identify one or more visual media assets. The video image specification may also specify the screen position where each identified asset is to be displayed. Examples of video media assets include: graphic image files (e.g., GIF files, JPEG files, bitmap files, etc.), video files (e.g., MPEG files, AVI files), text messages, etc. It is these assets that are used to create the visual complement to the audio service.

The video image specification for a particular channel is based, at least in part, on the sound recording that the particular channel is currently playing. Therefore, for example, if a U2 song from the Joshua Tree album is currently being played on channel **51**, then, at some particular point in time while the song is playing, the video image specification for channel **51** might specify that an image of the Joshua Tree album art is to be displayed at a first location **202** (see FIG. **2**) on a TV screen (or monitor) **282**.

Additionally, the video image specification may also specify that the name of the song, artist, and album is to be displayed at a second location **204** on the TV screen **282**, and an advertising banner is to be displayed at a third location **206** on the TV screen **282**.

In one embodiment, the video image specification may also specify that certain music trivia and/or news is to be displayed at a fourth location **208** on the TV screen **282**. It should be understood that album art, advertising banners, text messages, and other visual media assets may be positioned anywhere on the TV screen **282** and that the invention is not limited to the particular arrangement of visual media assets shown in FIG. **2**.

The video image specification may also be time driven. That is, at least some of the assets (e.g., advertising banners, music trivia, and news) specified by the video image specification are determined as function of time, regardless of which sound recording is currently playing. That is, certain assets are selected based on, for example, the time of day rather than based on the sound recording that is playing.

Preferably, each video image specification for a particular channel includes an asset identifier that identifies a text message that contains information pertaining to the sound recording that is currently being played over the particular channel. This information may include the name of the artist who created the sound recording, the title of the sound recording, and the name of an album on which the sound recording can be found. Alternatively, instead of or in addition to each video image specification for the particular channel including the asset identifier that identifies the text message, the text message itself may be included in the data packet.

In addition to including a video image specification, the data packet may further include purchase information for enabling a listener of system **100** to purchase the album or the sound recording. The purchase information may include an indicator that the sound recording or album is saleable, a price, and a unique code that identifies the album.

FIG. **6** illustrates an exemplary data packet **600**. As shown in FIG. **6**, data packet **600** includes a video image specification **602**. Optionally, data packet **600** may also include sound recording information **604**, and purchase information **606**. Video image specification **602** comprises a list of visual media asset identifiers and associates a screen position with each asset identifier. The data packets may be extensible mark-up language (XML) files or hyper-text mark-up language (HTML) files.

In the embodiment shown in FIG. **1**, after generating a data packet for a particular channel, video subsystem **104** transmits the data packet so that it will be received by transmission system **170**. Video subsystem **104** may use transmission subsystem **190** to transmit the data packet to transmission system **170** or may use a public network (e.g., the Internet) or private network to transmit the data packet to transmission system **170**.

Transmission system **170** may have access to a data storage unit **185**. Preferably, storage unit **185** has a very short access time. Storage unit **185** stores the visual media assets specified in the data packet (storage unit **185** is updated periodically by an administrator to ensure that storage unit **185** contains the necessary visual media assets). Therefore, borrowing from the above example, storage unit **185** stores the image of the Joshua Tree album art that is displayed when the song from U2's Joshua Tree album is playing.

In embodiments where transmission system **170** does not have access to storage unit **185**, a storage unit **186** that is coupled to video subsystem **104** stores the visual media assets specified in the video image specification, and video subsystem **104** retrieves the assets from storage **186** and transmits them to transmission system **170**.

After receiving the data packet for the particular channel, transmission system **170** parses the data packet and determines the video image specification and purchase information that are specified therein. Transmission system **170** then creates a video image corresponding to the video image specification and transmits the video image over the particular channel to subscribers' audio/video receivers **180**. The video image is then displayed by audio/video device **182**.

The video image conforms to the video image specification contained in the data packet so that when the video image is displayed on the subscribers' audio/video device **182**, the visual media assets defined in the video image specification are displayed in the locations as specified in the video image specification.

The video image may be encoded according to a Moving Pictures Experts Group (MPEG) standard, the National Television Standards Committee (NTSC) video signal standard, or other video signal standard. In one specific embodiment, the video image is encoded according to an MPEG standard and comprises an MPEG I-frame followed by null P-frames.

FIGS. **3**A-**3**C are flow charts illustrating processes **300**, **330**, and **360**, according to one embodiment, performed by audio subsystem **102**, video subsystem **104**, and transmission system **170** respectively, for providing an interactive, visual complement to the audio service for a particular channel. The same process is performed for the other channels.

Process **300** (see FIG. **3**A) begins in step **302**, where audio subsystem **102** selects a sound recording from library **105** based on a playlist for the particular channel. After selecting the sonnd recording, audio subsystem **102** retrieves it from library **105**, encodes it, and transmits it to transmission subsystem **190** (step **304**), which then transmits it to a system, such as, for example, a transmission system **170**, that transmit audio/video signals to the subscribers' receivers **180**.

At or about the same time as step **304** is performed, audio subsystem **102** transmits to video subsystem **104** a trigger message specifying a sound recording identifier that identifies the sound recording selected in step **302**, sound recording information pertaining to the sound recording, and a channel identifier (step **306**). The sound recording identifier uniquely identifies the sound recording selected in step **302** and the channel identifier uniquely identifies the particular channel. After audio subsystem **102** finishes transmitting the sound recording selected in step **302**, control passes back to step **302**, where audio subsystem **102** selects another sound recording from library **105** based on the playlist for the particular channel after it has finished streaming the previously selected sound recording for that channel.

Process **330** (see FIG. **3**B) begins in step **332**, where video subsystem **104** waits for a trigger message from audio subsystem **102** or for a timer to expire. If video subsystem **104** receives a trigger message from audio subsystem **102**, control passes to step **334**, and if a timer expires, control passes to step **338**.

In step **334**, video subsystem **104** parses the trigger message to determine the sound recording identifier, sound recording information, and channel identifier specified therein. Next (step **336**), video subsystem **104** uses this information, together with pre-defined configuration data that is associated with the channel identified by the channel identifier, to create a data packet for the identified channel. The predefined configuration data is stored in video subsystem **104**. An illustration of pre-defined configuration data is shown in FIG. **4**, and will be discussed in more detail further below.

In step **338**, video subsystem **104** determines a channel and an asset identifier queue that is associated with the expired timer (see element **420** of FIG. **4** for an illustration of an exemplary queue). Next (step **340**), video subsystem **104** may create a data packet for the identified channel based, at least in part, on the contents of the asset identifier queue associated with the expired timer. An illustration of a

process **500** for creating a data packet is shown in FIG. **5**, and will be discussed in more detail further below.

After creating the data packet in either step **336** or **340**, video subsystem **104** transmits the data packet to audio/video transmission system **170** (step **342**). After step **342**, control passes to step **344**. In step **344**, video subsystem retrieves from a storage unit **186** the visual media assets specified in the data packet and transmits the assets to transmission system **170** if storage unit **185** does not contain the assets. After step **344**, control passes back to step **332**.

Process **360** (see FIG. **3**C) begins in step **362**. In step **362**, audio/video signal transmission system **170** receives from transmission subsystem **190** the audio stream transmitted by audio subsystem **102**. Next (step **364**), transmission system **170** transmits the audio stream to receivers **180**.

While transmission system **170** is receiving and transmitting the audio stream, transmission system **170** receives from video subsystem **104** a data packet for the particular channel (step **366**). After receiving the data packet for the particular channel, transmission system **170** parses the data packet and determines the video image specification and purchase information (if any) specified therein (step **368**). That is, transmission system **170** determines the set of asset identifiers specified by the video image specification and the screen position associated with each asset identifier, which may also be specified by the video image specification.

Next (step **370**), transmission system **170** retrieves from storage unit **185** the assets identified by the asset identifiers determined in step **368**, but if storage unit **185** does not have the assets, then transmission system **170** receives them from video subsystem **104**, as described above.

Next (step **372**), transmission system **170** determines whether the purchase information indicates that a "Buy" button **250** and/or "Buy-Previous" button **251** should be included in of the video image transmitted to receivers **180**. Buy button **250** and Buy-Previous button **251** are interactive, selectable buttons that a user of system **100** may select if the user desires to make a purchase.

If it is determined that Buy button **250** and/or Buy-Previous button **251** should be included in the video image transmitted to receivers **180**, then control passes to step **376**, otherwise control passes to step **374**.

In step **374**, transmission system **170** uses the assets retrieved in step **370** and screen position information determined in step **368** to create a video image that conforms to the video image specification contained in the data packet. In step **376**, transmission system **170** performs the same step as in step **374**, but also adds Buy button **250** and/or Buy-Previous button **251** to the video image. After step **374** and step **376**, control passes to step **378**. In step **378**, the video image created in step **374** or **376** is transmitted to receivers **180**. After step **378**, control passes back to step **366**.

Alternatively, transmission system **170** does not perform step **376**. Rather, if it is determined that Buy button **250** and/or Buy-Previous button **251** should be included in the video image created in step **372**, then transmission system **170** sends one or more commands to receivers **180** that direct the receivers **180** to overlay Buy button **250** and or Buy-Previous button **251** onto the video image transmitted in step **378**, provided that receivers **180** are capable of overlying selectable buttons.

A listener who desires to purchase a saleable item may select the Buy **250** or Buy-Previous **251** button to initiate a conventional e-commerce transaction with transaction processing system **106**. The listener may select the Buy or Buy-Previous button by, for example, selecting a pre-defined button on a remote control (not shown) that communicates with a receiver **180**.

In response to the listener selecting a button **250** or **251**, a user interface screen is presented on audio/video device **182**. The screen provides information regarding the product (i.e., the album or song currently playing), such as purchase price. If the listener decides to purchase the product, the listener may, for example, select another pre-defined button on the remote control. This will cause a message to be sent from the listener's receiver **180** to transaction processing system **106**. The message indicates that the listener desires to purchase the product and may contain an identifier that identifies the product and an identifier that identifies the listener or a registered user account. The receiver may directly send the message to the system **106** through a network, such as the Internet, or may send the message to transmission system **170**, which then relays the message to system **106**. Upon receiving the message, transaction processing system **106** process the purchase transaction and/or communicates with a vendor who provides the product.

Referring now to FIG. **4**, FIG. **4** illustrates pre-defined configuration data **400** that is associated with a particular channel and that is used by video subsystem **104** to create data packets for the particular channel. As shown in FIG. **4**, the pre-defined configuration data **400** associates visual media asset identifiers with sound recording identifiers. Each asset identifier uniquely identifies a visual media asset. Thus, configuration data **400** associates visual media assets with a sound recordings.

Preferably, the visual media assets associated with a sound recording are to be displayed during the entire time the sound recording is being played. For example, as shown in FIG. **4**, sound recording identifier **402** is associated with asset identifiers **404** and **406**. Thus, when system **100** plays the sound recording identified by sound recording identifier **402**, the assets identified by asset identifiers **404** and **406** should be displayed to the listeners. Preferably, the configuration data associates a position with each visual media asset. For example, assets **404** and **406** are associated with positions **5** and **3** respectively.

The configuration data may also specify one or more asset queues. An asset queue is an ordered list of asset identifier sets. An asset identifier set contains one or more asset identifiers and a screen position for each asset identifier. Preferably, a time duration is associated with each asset identifier set in a queue. For example, the exemplary configuration data **400** illustrated in FIG. **4**, specifies two asset queues: queue **420** and **430**. Queue **420**, for example, contains asset sets **421-423**, and assets **421-423** are associated with a time duration of 30 seconds, 60 seconds, and 45 seconds, respectively. As an example, asset identifier set **421** contains asset identifiers **491** and **492**, where asset identifier **491** is associated with screen position **1** and asset identifier **492** is associated with screen position **2**.

In addition to associating a sound recording identifier with certain asset identifiers, the configuration data may also associate a sound recording identifier with one or more of the asset identifier queues. For example, as shown in FIG. **4**, sound recording **402** is associated with asset identifier queue **420** and **430**. Because asset sets **421-423** are listed in queue **420** and because queue **420** is associated with sound recording **402**, assets identified by asset identifier sets **421-423** are displayed sequentially for the specified duration of times while sound recording **402** is being played. That is, while sound recording **402** is being played, the assets identified by asset identifier set **421** are displayed for its specified dura-

tion (i.e., 30 seconds), followed by the assets identified by asset identifier set **422** for its specified duration (i.e., 60 seconds), and then followed by the assets identified by asset identifier set **423** for its specified duration (i.e., 45 seconds).

Referring now to FIGS. **5**A and **5**B, FIGS. **5**A and **5**B is a flow chart illustrating a process **500**, according to one embodiment, for creating a data packet for a particular channel. Process **500** begins in step **501** wherein video subsystem **104** initializes a data packet so that it does not contain any data. Next (step **502**), video subsystem **104** determines whether a trigger message from audio subsystem has been received. If a trigger message is received, control passes to step **504**, otherwise control passes to step **503**. In step **503**, video subsystem **104** determines whether an asset queue timer has expired. If an asset queue timer expires, control passes to step **540**, otherwise control passes back to step **502**.

In step **504**, video subsystem **104** parses the trigger message to determine the sound recording identifier, sound recording information, and channel identifier specified therein. Next (step **506**), video subsystem **104**, uses the pre-defined configuration data to determine a set of assets identifiers that are associated with the sound recording identifier last determined in step **504**. Video subsystem **104** then determines the screen position that is associated with each asset identifier in the set (step **508**). The asset identifiers determined in step **506** and their associated screen positions determined in step **508** are included in the data packet (step **510**).

Next (step **512**), video subsystem **104** uses the pre-defined configuration data to determine whether there are any asset identifier queues associated with the sound recording identifier determined in step **504**. If there are, control passes to step **514**, otherwise control passes to step **528**.

In step **514**, video subsystem **104** selects one of the queues that the configuration data indicates is associated with the sound recording identifier. Next (step **516**), video subsystem determines the asset identifier set in the selected queue that is at the "head" of the selected queue. In one embodiment, video subsystem **104** maintains a head pointer for each queue specified by the configuration data. The head pointer for a queue points to the asset identifier set in the queue that is at the head of the queue. Thus, video subsystem **104** may use the head pointer to determine the asset identifier set in the selected queue that is at the head of the selected queue. After step **516**, control passes to step **518**.

In step **518**, video subsystem **104** includes in the data packet each asset identifier listed in the asset identifier set determined in step **516** together with each asset identifier's associated screen position. Next (step **520**), video subsystem **104** determines the duration associated with the asset identifier set determined in step **516**. Next (step **522**), video subsystem **104** activates the timer associated with the selected queue so that the timer will expire after X amount of time has expired, where X is equal to the duration determined in step **518**. After step **522**, control passes to step **524**.

In step **524**, video subsystem **104** determines whether there are additional asset identifier queues associated with the sound recording identifier. If there are, control passes to step **526**, otherwise control passes to step **528**. In step **526**, video subsystem **104** selects a queue that is associated with the sound recording and that has not already been selected since the trigger message was received. After step **526**, control passes back to step **516**.

In step **528**, video subsystem **104** includes in the data packet the sound recording information and purchase information included in the trigger message received in step **502**. This information concerns the sound recording identified by the sound recording identifier determined in step **504**. In one embodiment, the trigger message does not include this information, rather, this information is included in the pre-defined configuration data. More specifically, the pre-defined configuration data associates sound recording information and purchase information with each sound recording identifier included in the configuration data, as shown in FIG. **4**. After step **528**, control passes to step **530**, where the data packet is transmitted to transmission system **170**. After step **530**, control passes back to step **502**.

In step **540**, video subsystem **104** determines the queue that is associated with the timer that expired. Next (step **542**), video subsystem **104** increments the head pointer associated with the queue determined in step **540** to point to the next asset identifier set in the queue if the queue determined in step **540** is associated with the sound recording identifier determined in step **504**. However, if the head pointer is pointing to the last asset identifier set in the queue, video subsystem resets the pointer to point to the asset identifier set that is at the top of the queue. In this way, the queues are circular queues. After step **542**, control passes to step **506**.

FIG. **7** is a block diagram of a system **700** for providing audio/video programming according to another embodiment of the present invention. System **700** is identical to system **100** with the exception that system **700** further includes a video image generator **702** that is coupled to video subsystem **104**. Video image generator **702** has access to storage **186**, which stores the visual media assets necessary to create the visual complement to the audio service.

Additionally, instead of transmission system **170** receiving data packet **131** generated by video subsystem **104**, as described above with respect to FIG. **1**, video image generator **702** receives a data packet **732** generated by video subsystem **104**. Data packet **732** comprises a video image specification. Further, video subsystem **104** may also generate a data packet **731** and transmits data packet **731** to transmission subsystem **190**. Data packet **731** comprises purchase information and/or sound recording information corresponding to the sound recording most recently selected by audio subsystem **102**.

Video image generator **702** functions to create a video image based on the video image specification contained in data packet **732**. In one embodiment, after creating the video image, generator **702** transmits the video image to transmission subsystem **190**. Transmission subsystem **190** functions to transmits the video image, data packet **731** (if any), and the audio stream generated by audio subsystem **102** to transmission system **170**. In one embodiment, the video image, data packet **731** and audio stream are transmitted together in an MPEG-2 data stream.

In the embodiment shown in FIG. **7**, audio subsystem **102** performs process **300**, as described above. However, video subsystem **104** does not perform process **330** and transmission system **170** does not perform process **360**. Rather, video subsystem **104** performs process **800**, which is shown in FIG. **8**. Additionally, video image generator performs a process **900**, which is shown in FIG. **9**.

Process **800** begins in step **802**, where video subsystem **104** waits for a trigger message from audio subsystem **102** or for a timer to expire. If video subsystem **104** receives a trigger message from audio subsystem **102**, control passes to step **804**, and if a timer expires, control passes to step **820**.

In step **804**, video subsystem **104** parses the trigger message to determine the sound recording identifier, sound

recording information, and channel identifier specified therein. Next (step **806**), video subsystem **104** uses this information, together with the pre-defined configuration data that is associated with the channel identified by the channel identifier, to create a data packet **731** for the identified channel.

Data packet **731** created in step **806** comprises purchase information and/or sound recording information. The purchase and/or sound recording information may be included in the trigger message and/or included in the pre-defined configuration data. After step **806**, control passes to step **808**. In step **808**, video subsystem **104** uses the sound recording identifier determined in step **804** and the pre-defined configuration data to create a data packet **732**. Data packet **732** comprises a video image specification (e.g., a list of visual media asset identifiers together with their associated positions). After generating data packets **731** and **732**, video subsystem **104** performs steps **810** and **812**. In step **810**, video subsystem **104** transmits data packet **731** to transmission system **190** (or to transmission system **170**). In step **812**, video subsystem **104** provides data packet **732** to video image generator **702**.

In step **820**, video subsystem **104** determines a channel and an asset identifier queue that is associated with the expired timer. Next (step **822**), video subsystem **104** creates for the identified channel a data packet **732** that comprises a video image specification. Next (step **812**) data packet **732** is provided to video image generator **702**. After step **812**, control passes back to step **802**.

Referring now to process **900**, process **900** begins in step **902**, where video image generator **702** waits to receive from video subsystem **104** a data packet **732**, which comprises a video image specification. When a data packet **732** is received, control passes to step **904**, where video image generator **702** parses the video image specification contained in the data packet **732** to determine the set of asset identifiers specified therein and the screen positions associated with each asset identifier. After step **904**, control passes to step **906**.

In step **906**, video image generator **702** retrieves from storage **186** the visual media assets identified by the asset identifiers determined in step **904**. Alternatively, in one embodiment, video image generator **702** does not have access to storage **186**, but video subsystem **104** does. In this embodiment, generator **702** requests video subsystem **104** to retrieve and transmit to generator **702** the visual media assets identified by the asset identifiers determined in step **904**.

Next (step **908**), video image generator **702** uses the retrieved visual media assets and the screen positions determined in step **904** to create a video image that conforms to the video image specification. Video image generator **702** then transmits the video image to transmission subsystem **190** (step **910**). After step **910**, control passes back to step **902**.

In one embodiment, data packet **732** is an HTML document and video image generator **702** is a hardware/software device that convert the HTML document to an MPEG video presentation. In one specific embodiment, video image generator converts the HTML document into an MPEG I-frame followed by null P-frames. Such a device can be purchased from Liberate Technologies of San Carlos, Calif.

FIG. **10** is a block diagram of a system **1000** for providing audio/video programming according to another embodiment of the present invention. System **1000** is similar to systems **100** and **700**. However, in system **1000** video subsystem **104** comprises the video image generator **702**, which may be implemented in hardware and/or software. In this embodiment, a data packet that comprises a video image specification, such as data packet **732**, is not needed because video subsystem **104** itself creates the video images that compliment the audio service. FIG. **11** illustrates a process **1100** performed by video subsystem **104** according to the embodiment shown in FIG. **10**.

Process **1100** begins in step **1102**, where video subsystem **104** determines whether a trigger message from audio subsystem has been received. If a trigger message is received, control passes to step **1104**, otherwise control passes to step **1103**. In step **1103**, video subsystem **104** determines whether an asset queue timer has expired. If an asset queue timer expires, control passes to step **1140**, otherwise control passes back to step **1102**.

In step **1104**, video subsystem **104** parses the trigger message to determine the sound recording identifier specified therein. Next (step **1106**), video subsystem **104**, uses the pre-defined configuration data to determine a set of assets identifiers that are associated with the sound recording identifier determined in step **1104**. Video subsystem **104** then determines the screen position that is associated with each asset identifier in the set (step **1108**). Next (step **1112**), video subsystem **104** uses the pre-defined configuration data to determine whether there are any asset identifier queues associated with the sound recording identifier determined in step **1104**. If there are, control passes to step **1114**, otherwise control passes to step **1128**.

In step **1114**, video subsystem **104** selects one of the queues that the configuration data indicates is associated with the sound recording identifier. Next (step **1116**), video subsystem determines the asset identifier set in the selected queue that is at the "head" of the selected queue. After step **1116**, control passes to step **1118**.

In step **1118**, video subsystem **104** determines each asset identifier listed in the asset identifier set determined in step **1116** together with each asset identifier's associated screen position. Next (step **1120**), video subsystem **104** determines the duration associated with the asset identifier set determined in step **1116**. Next (step **1122**), video subsystem **104** activates the timer associated with the selected queue so that the timer will expire after X amount of time has expired, where X is equal to the duration determined in step **1118**. After step **1122**, control passes to step **1124**.

In step **1124**, video subsystem **104** determines whether there are additional asset identifier queues associated with the sound recording identifier. If there are, control passes to step **1126**, otherwise control passes to step **1128**. In step **1126**, video subsystem **104** selects a queue that is associated with the sound recording and that has not already been selected. After step **1126**, control passes back to step **1116**.

In step **1128**, video subsystem **104** retrieves the assets identified by the asset identifiers determined in steps **1106** and **1118**. Next (step **1130**), video subsystem **104** creates a video image using the retrieved assets, wherein each asset is positioned in the video image according its associated position. After step **1130**, control passes to step **1130**, where the video image is transmitted to transmission system **190**. After step **1132**, control passes back to step **1102**.

In step **1140**, video subsystem **104** determines the queue that is associated with the timer that expired. Next (step **1142**), video subsystem **104** increments the head pointer associated with the queue determined in step **1140** to point to the next asset identifier set in the queue if the queue determined in step **1140** is associated with the sound recording identifier determined in step **1104**. After step **1142**, control passes to step **1106**.

In another embodiment, the video images that complement the audio service are pre-generated. That is, they are generated prior to the time when they are scheduled to be displayed. For example, they may be generated one day or one week prior to when they are scheduled to be displayed.

In this embodiment where video images are pre-generated, a data structure (e.g., a configuration file) associates the sound recording identifiers listed in a playlist with an ordered set of video image identifiers, where each video image identifier identifies a pre-generated video image. The set may contain one or more video image identifiers. If the ordered set of video image identifiers associated with a sound recording identifier contains more than one video image identifier, then each video image identifier in the set, except the video image identifier that is last in the order, is associated with a time duration. The data structure may also associate purchase information with each sound recording identifier.

FIG. **12** illustrates an exemplary data structure **1200** that associates sound recording identifiers from a playlist with a set of one or more video image identifiers. For example, sound recording identifier **1202** is associated with an ordered set **1204** of video image identifiers and is associated with purchase information **1205**.

The ordered set of video image identifiers **1204** includes video image identifiers **1210**, **1211**, and **1212**. Additionally, each video image identifier in set **1204**, except for video image identifiers **1212**, which is the last video image identifier in the order, is associated with a time duration.

Either video subsystem **104** or transmission system **170** may be able to retrieve the pre-generated video images from the storage unit in which they are stored. Thus, for example, the pre-generated video images may be stored in storage unit **185** or storage unit **186**. Similarly, either video subsystem **104** or transmission system **170** may be able to retrieve data structure **1200**.

If, for example, the pre-generated video images are stored in storage unit **185** and transmission system **170** has access to data structure **1200**, then the trigger message generated by audio subsystem **102** may be sent to transmission system **170** instead of to video subsystem **104**. In this embodiment, transmission system **170** performs process **1300** (see FIG. **13**).

Process **1300** begins in step **1302**, where transmission system **170** receives a trigger message that includes a sound recording identifier. Next (step **1304**) transmission system **170** parses the trigger message to determine the sound recording identifier included therein. Next (step **1305**), transmission system **170** accesses data structure **1200** to determine the ordered set of video image identifiers and purchase information that are associated with the sound recording identifier determined in step **1304**. Next (step **1306**), transmission system **170** retrieves from storage unit **185** the video image identified by the first identifier in the set.

Next (step **1308**), transmission system **170** determines, based on the purchase information (or lack thereof), whether it should overlay Buy button **250** on the video image or send a command to the receivers **180** that causes the receivers to overlay Buy button **205** on the video image. If it should, control passes to step **1310**, otherwise control passes to step **1311**. In step **1310**, transmission system **170** transmits to receivers **180** the most recently retrieved video image with Buy button **250** included in the video image (or transmits to receivers **180** the video image together with a command that instructs receivers **180** to display Buy button **250**). In step **1311**, transmission system **170** transmits to receivers **180** the video image only.

Next (step **1312**), transmission system **170** accesses data structure **1200** to determine whether there is a time duration associated with the video image transmitted in step **1310** or **1311**. That is, transmission system **170** determines whether data structure **1200** associates a time duration with the video image identifier that identifies the video image. If there is no time duration associated with the video image, then control passes back to step **1302**, otherwise control passes to step **1314**. In step **1314**, transmission system **170** sets a timer to expire after X seconds and activates the timer, where X is the time duration in seconds associated with the video image transmitted in step **1310** or **1311**. When the timer expires, transmission system **170** retrieves from storage unit **185** the video image identified by the next identifier in the set (step **1316**) After step **1316**, control passes back to step **1308**.

If, for example, the pre-generated video images are stored in storage unit **185** but transmission system **170** does not have access to data structure **1200**, then the trigger message is sent to video subsystem **104**, which will have access to data structure **1200**. In this embodiment, video subsystem **104** and transmission system **170** perform processes **1400** (see FIG. **14**A) and process **1450** (see FIG. **14**B), respectively. Alternatively, video subsystem **104** and transmission system **170** perform processes **1500** (see FIGS. **15**A and **1550** (see FIG. **15**B), respectively.

Process **1400** begins in step **1402**, where video subsystem **104** receives a trigger message that includes a sound recording identifier. Next (step **1404**) video subsystem **104** parses the trigger message to determine the sound recording identifier included therein. Next (step **1406**), video subsystem **104** accesses data structure **1200** to determine the ordered set of video image identifiers that is associated with the sound recording identifier determined in step **1404**. Next (step **1407**), video subsystem **104** selects the first video image identifier from the ordered set of video image identifiers.

Next (step **1408**), video subsystem **104** transmits the most recently selected video image identifier to transmission system **170**. In addition to transmitting the video image to transmission system **170**, video subsystem may also transmit to transmission system **170** purchase information and/or commands that instruct transmission system **170** to overlay selectable buttons (e.g., Buy button **250**) on the video image to create an interactive service for the listeners. After step **1408**, control passes to step **1410**.

In step **1410**, video subsystem **104** accesses data structure **1200** to determine whether there is a time duration associated with the video image identifier transmitted in step **1408**. If there is no time duration associated with the video image identifier, then control passes back to step **1402**, otherwise control passes to step **1414**.

In step **1414**, video subsystem **104** sets a timer to expire after X seconds and activates the timer, where X is the time duration in seconds associated with the video image identifier. When the timer expires, video subsystem **104** selects the next identifier in the ordered set (step **1416**). After step **1416**, control passes back to step **1408**.

Process **1450** begins in step **1452**, where transmission system **170** receives a video image identifier and purchase information (if any) from video subsystem **104**. Next (step **1456**), transmission system **170** retrieves from storage unit **185** the video image identified by the received identifier. Next (step **1458**), transmission system **170** determines, based on the purchase information (or lack thereof), whether

it should overlay Buy button **250** on the video image or send a command to the receivers **180** that causes the receivers to overlay Buy button **205** on the video image. If it should, control passes to step **1460**, otherwise control passes to step **1461**. In step **1460**, transmission system **170** transmits to receivers **180** the retrieved video image with Buy button **250** included in the video image (or transmits to receivers **180** the video image together with a command that instructs receivers **180** to display Buy button **250**). In step **1461**, transmission system **170** transmits to receivers **180** the video image only. After steps **1460** and **1461** control passes back to step **1452**.

Process **1500** begins in step **1502**, where video subsystem **104** receives a trigger message that includes a sound recording identifier. Next (step **1504**) video subsystem **104** parses the trigger message to determine the sound recording identifier included therein. Next (step **1506**), video subsystem **104** accesses data structure **1200** to determine the ordered set of video image identifiers that is associated with the sound recording identifier determined in step **1504**. Next (step **1508**), video subsystem **104** transmits to transmission system **170** the ordered set of video image identifiers and the purchase information associated with the sound recording identifier. After step **1508**, control passes back to step **1502**.

Process **1550** is similar to process **1300**. Process **1550** begins in step **1552**, where transmission system **170** receives the ordered set of video image identifiers and purchase information. After step **1552**, transmission system **170** performs steps **1306-1316**. After step **1316**, control passes back to step **1552**.

If, for example, the pre-generated video images are stored in storage unit **186** instead of **185** and video subsystem **104** has access to data structure **1200**, then the trigger message generated by audio subsystem **102** is sent to video subsystem **104**. In this embodiment, video subsystem **104** performs process **1600** (see FIG. **16**).

Process **1600** begins in step **1602** where video subsystem **104** receives a trigger message that includes a sound recording identifier. Next (step **1604**) video subsystem **104** parses the trigger message to determine the sound recording identifier included therein. Next (step **1606**), video subsystem **104** accesses data structure **1200** to determine the ordered set of video image identifiers that is associated with the sound recording identifier determined in step **1604**. Next (step **1608**), video subsystem **104** retrieves from storage unit **186** the video image identified by the first identifier in the set. Next (step **1610**), video subsystem **104** transmits the most recently retrieved video image to transmission system **170**. In addition to transmitting the video image to transmission system **170**, video subsystem may also transmit to transmission system **170** purchase information and/or commands that instruct transmission system **170** to overlay selectable buttons (e.g., Buy button **250**) on the video image to create an interactive service for the listeners. After step **1610**, control passes to step **1612**.

In step **1612**, video subsystem **104** accesses data structure **1200** to determine whether there is a time duration associated with the video image transmitted in step **1610**. That is, video subsystem **104** determines whether data structure **1200** associates a time duration with the video image identifier that identifies the video image. If there is no time duration associated with the video image, then control passes back to step **1602**, otherwise control passes to step **1614**. In step **1614**, video subsystem **104** sets a timer to expire after X seconds and activates the timer, where X is the time duration in seconds associated with the video image. When the timer expires, video subsystem **104** retrieves from storage unit **186** the video image identified by the next identifier in the set (step **1616**). After step **1616**, control passes back to step **1610**.

While various embodiments/variations of the present invention have been described above, it should be understood that they have been presented by way of example only, and not limitation. Thus, the breadth and scope of the present invention should not be limited by any of the above-described exemplary embodiments, but should be defined only in accordance with the following claims and their equivalents.

What is claimed is:

1. A system for providing a visual complement to an audio service, comprising:

a first transmission system configured to transmit data to a second transmission system, wherein the second transmission system is configured to transmit the data to one or more audio/video receivers;

an audio subsystem configured to select sound recordings according to a playlist and transmit, according to the playlist, the selected sound recordings to the first transmission system for relay to the second transmission system; and

a video subsystem, wherein

the audio subsystem is further configured to transmit to the video subsystem a trigger message after selecting a sound recording, wherein the trigger message comprises an identifier associated with the selected sound recording, and

the video subsystem is configured to generate a video image specification that is based, at least in part, on pre-defined configuration data and information included in the trigger message, and is configured to generate the video image specification in response to receiving the trigger message, wherein the video subsystem is configured to transmit the video image specification so that it is received by the second transmission system, and the second transmission system is configured to generate a video image conforming to the video image specification and transmit the video image along with a sound recording received from the first transmission system to the one or more audio/video receivers.

2. The system of claim **1**, further comprising a storage unit for storing visual media assets, wherein the second transmission system is able to retrieve visual media assets from the storage unit.

3. The system of claim **1**, wherein the video image specification comprises a visual media asset identifier.

4. The system of claim **3**, wherein the second transmission system is configured to retrieve from the storage unit the visual media asset identified by the visual media asset identifier and use the visual media asset in generating the video image after receiving the video image specification.

5. The system of claim **1**, wherein the pre-defined configuration data comprises a plurality of identifiers, each of which is associated with a sound recording, and associates a set of visual media asset identifiers with each of the plurality of identifiers.

6. The system of claim **5**, wherein the pre-defined configuration data further comprises one or more queues of visual media asset identifier sets and further associates one or more of the queues with one or more of the plurality of identifiers.

7. The system of claim **6**, wherein at least one of said one or more queues includes a visual media asset identifier set that is associated with a time duration.

8. The system of claim 1, further comprising a video image generator coupled to the video subsystem, wherein the video subsystem is configured to provide the video image specification to the video image generator, the video image generator is configured to generate a video image conforming to the video image specification and transmit the video image so that it is received by the second transmission system, and the second transmission system is configured to transmit the video image to the one or more audio/video receivers.

9. The system of claim 8, further comprising a storage unit for storing visual media assets, wherein the video image generator is able to retrieve visual media assets from the storage unit.

10. The system of claim 9, wherein the video image specification comprises a visual media asset identifier.

11. The system of claim 10, wherein the video image generator is configured to retrieve from the storage unit the visual media asset identified by the visual media asset identifier and use the visual media asset in generating the video image after receiving the video image specification.

12. The system of claim 11, wherein the video image specification is contained within an HTML document and the video image is an MPEG video presentation.

13. A system for providing a visual complement to an audio service, comprising:

a first transmission system that is configured to transmit data to a second transmission system, wherein the second transmission system is configured to transmit the data to one or more audio/video receivers;

an audio subsystem that is configured to select sound recordings according to a playlist and transmit, according to the playlist, the selected sound recordings to the first transmission system for relay to the second transmission system; and

a video subsystem, wherein

the audio subsystem is further configured to transmits to the video subsystem a trigger message after selecting a sound recording, wherein the trigger message comprises an identifier associated with the selected sound recording,

the video subsystem is configured to generate a video image based, at least in part, on pre-defined configuration data and transmit the video image to the first transmission system for relay to the second transmission system after receiving the trigger message, and

the second transmission system is configured to transmit the video image to the one or more audio/video receivers.

14. The system of claim 13, further comprising a storage unit for storing visual media assets, wherein the video subsystem is able to retrieve visual media assets from the storage unit.

15. The system of claim 14, wherein, after receiving the trigger message comprising the identifier, the video subsystem is configured to determine, based, at least in part, on the pre-defined configuration data, a set of visual media asset identifiers.

16. The system of claim 15, wherein one or more of the visual media asset identifiers are associated with a screen position.

17. The system of claim 16, wherein the video subsystem is configured to retrieve from the storage unit the visual media assets identified by the set of visual media asset identifiers and use the visual media assets and the image position associated with the one or more visual media assets in generating the video image.

18. The system of claim 13, wherein the video image is an MPEG video presentation.

19. The system of claim 13, wherein the pre-defined configuration data comprises a plurality of identifiers, each of which is associated with a sound recording, and associates a set of visual media asset identifiers with each of the plurality of identifiers.

20. The system of claim 19, wherein the pre-defined configuration data further comprises one or more queues of visual media asset identifier sets and further associates one or more of the queues with one or more of the plurality of identifiers.

21. The system of claim 20, wherein at least one of said one or more queues includes a visual media asset identifier set that is associated with a time duration.

* * * * *

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(54) **METHOD AND SYSTEM FOR DISPLAYING CONTENT WHILE REDUCING BURN-IN OF A DISPLAY**

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G06F 17/00 (2006.01)

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See application file for complete search history.

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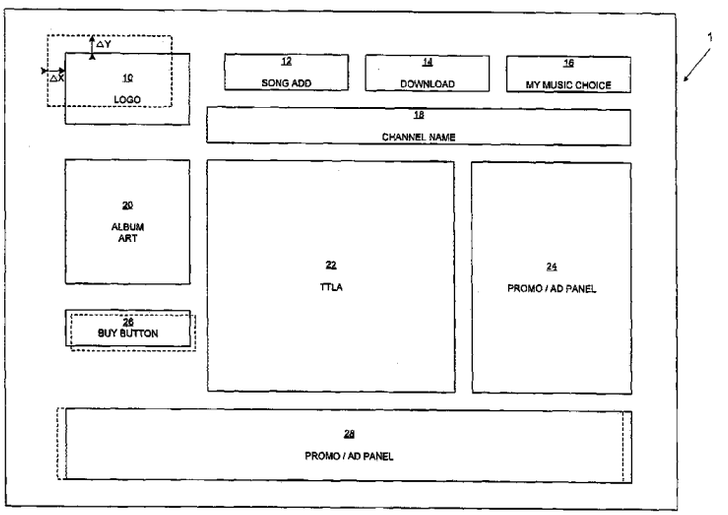
(57) **ABSTRACT**

A method and system for reducing burn-in of a display is disclosed. A plurality of assets containing text, graphics, and video are stored and then gathered. These assets are then assembled into a template to form a video frame or "screen", which is subsequently output in a video transport stream or video display. Based upon a trigger, the assets are gathered again and reassembled in a second template to form a second video frame or screen wherein the assets are in positions on the screen, which are different from those of the first screen. The second screen is subsequently output to the video transport stream and the process is repeated.

26 Claims, 5 Drawing Sheets



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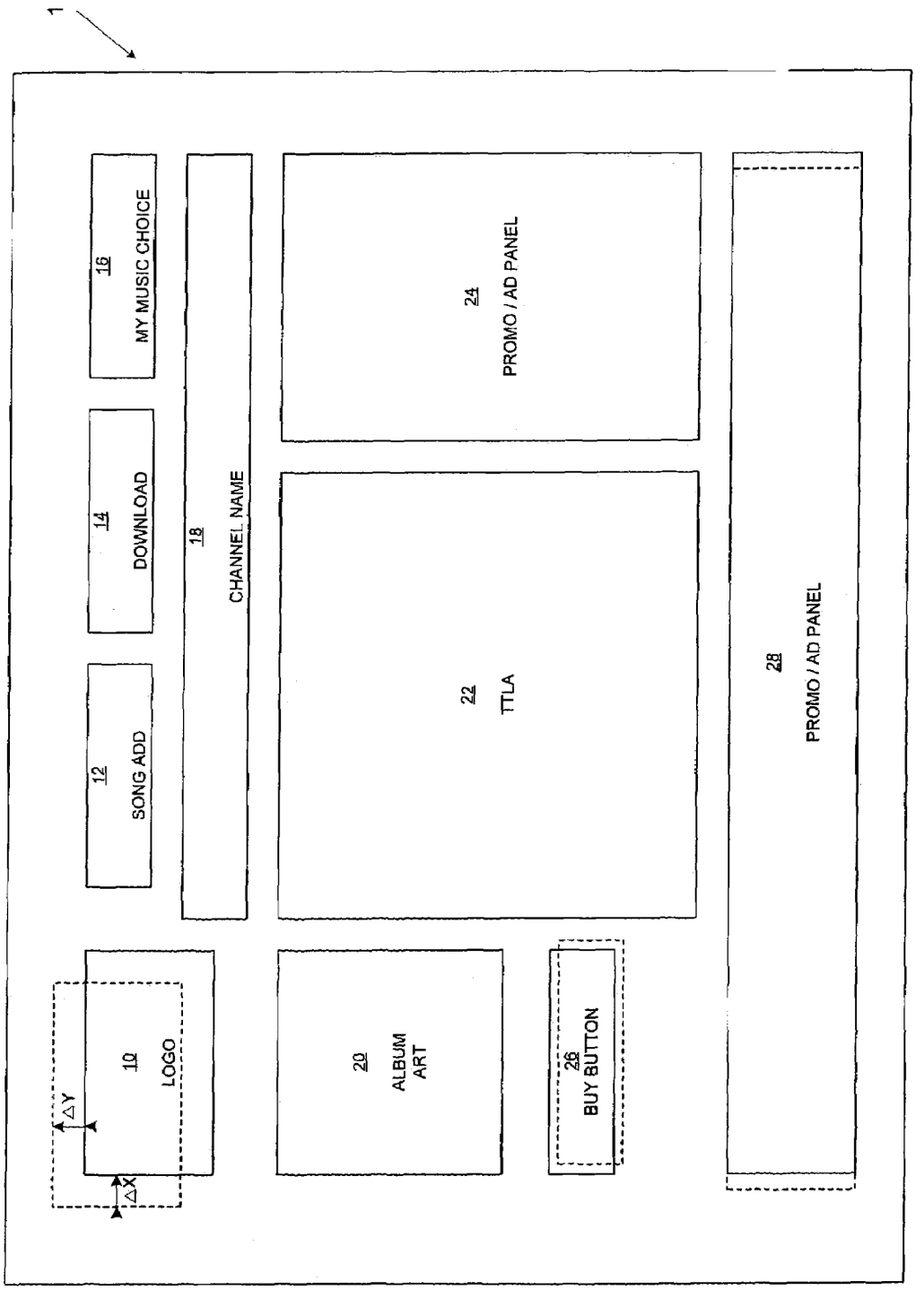
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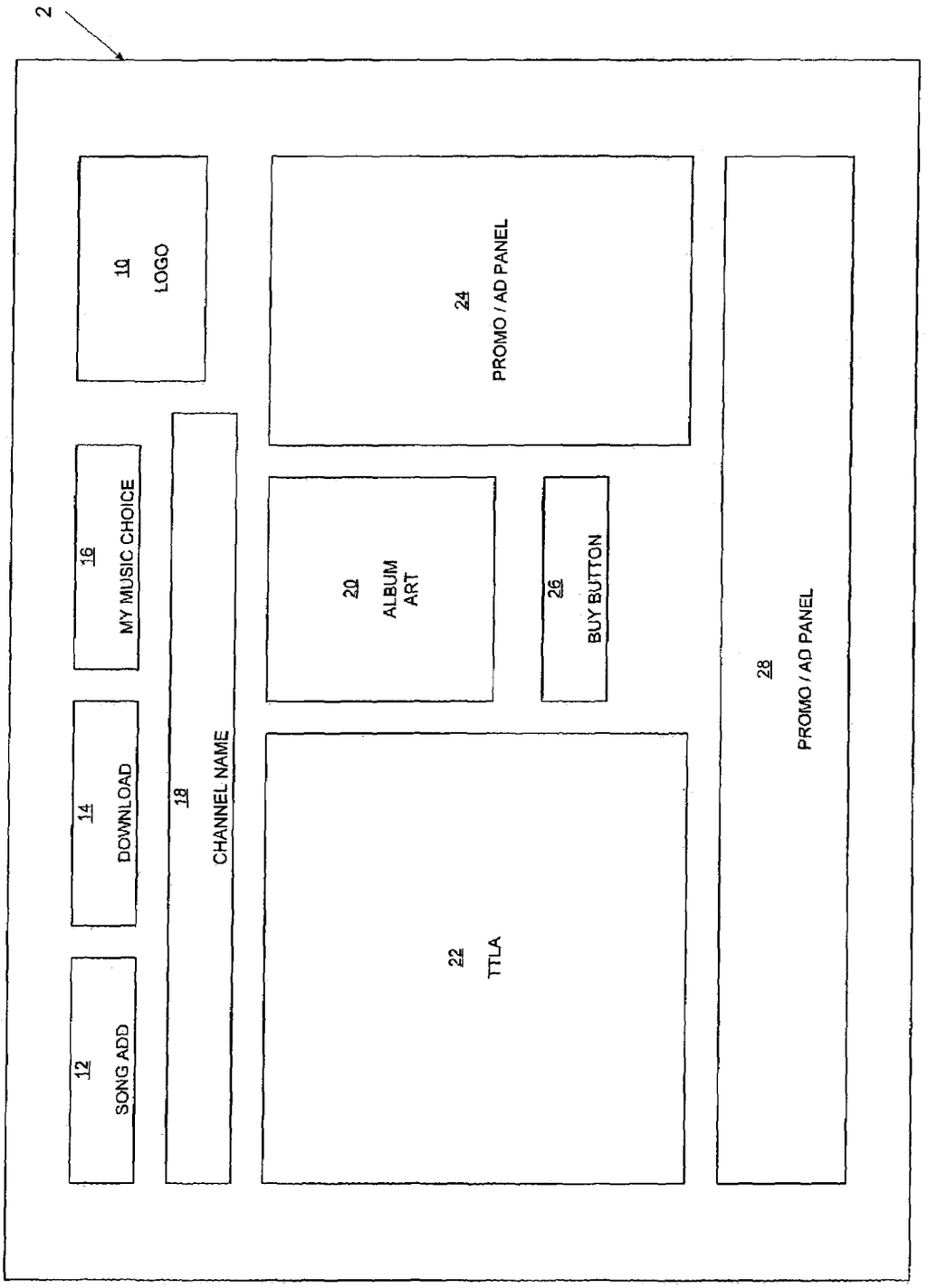
16
MY MUSIC CHOICE
14
DOWNLOAD
12
SONG ADD
18
CHANNEL NAME
24
PROMO / AD PANEL
22
TTLA
28
PROMO / AD PANEL
10
LOGO
ΔY
ΔX
20
ALBUM ART
26
BUY BUTTON

Fig. 1


2
10
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PROMO / AD PANEL
16
MY MUSIC CHOICE
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CHANNEL NAME
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BUY BUTTON
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PROMO / AD PANEL
14
DOWNLOAD
22
TTLA
12
SONG ADD

Fig. 2

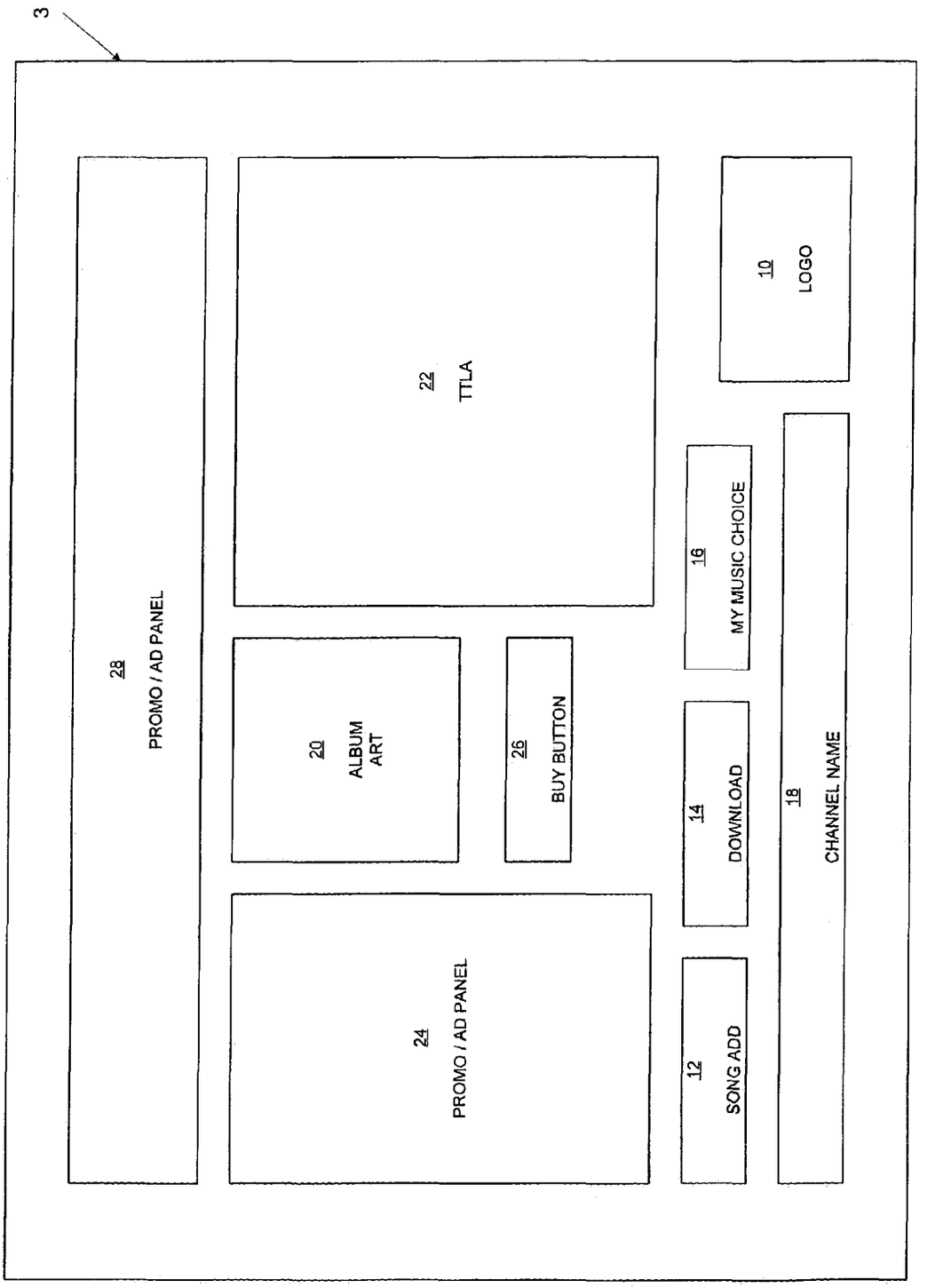
3
28
PROMO / AD PANEL
22
TTLA
10
LOGO
16
MY MUSIC CHOICE
20
ALBUM ART
26
BUY BUTTON
14
DOWNLOAD
18
CHANNEL NAME
24
PROMO / AD PANEL
12
SONG ADD

Fig. 3

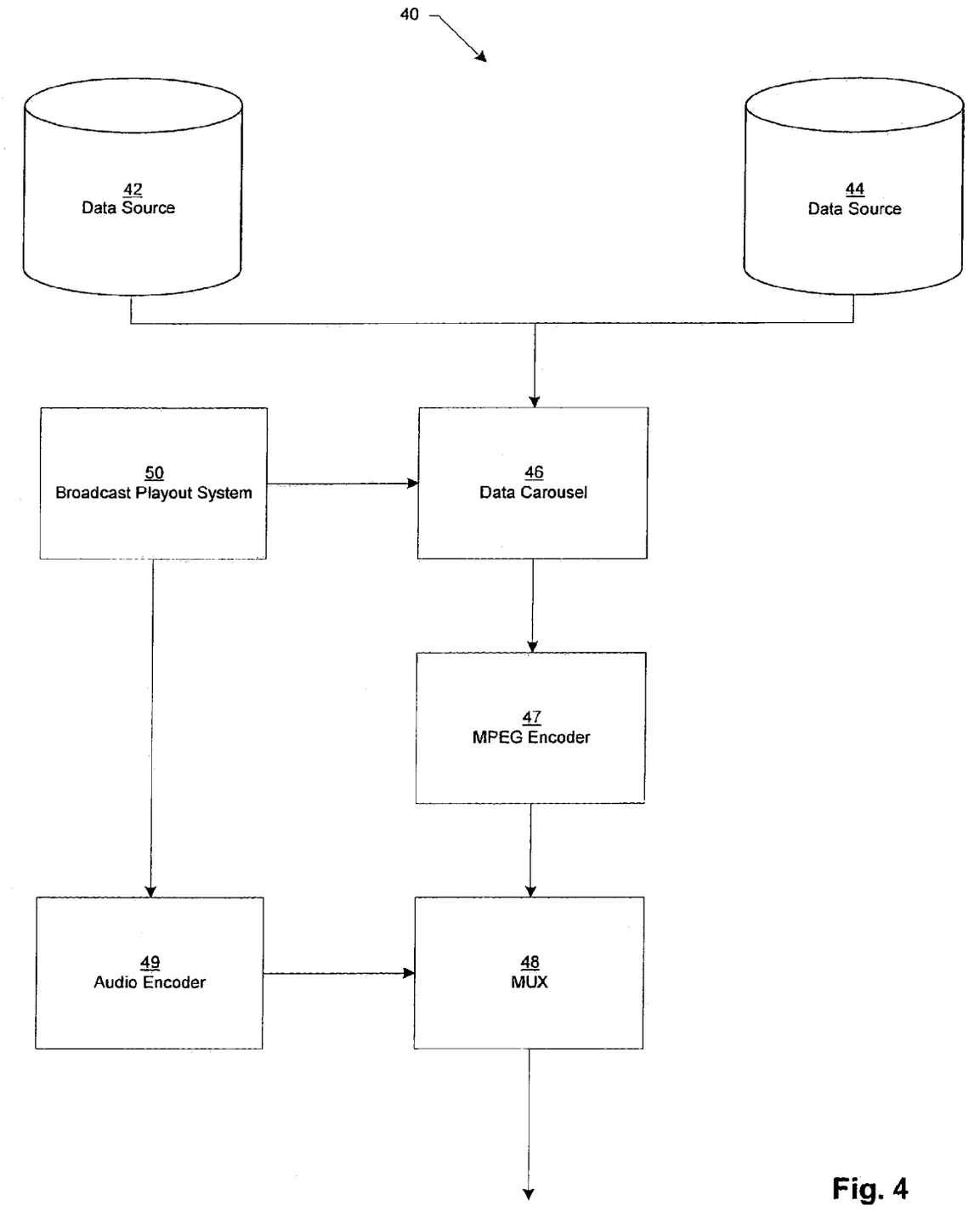
40
42
Data Source
44
Data Source
50
Broadcast Playout System
46
Data Carousel
47
MPEG Encoder
49
Audio Encoder
48
MUX
Broadcast

Fig. 4

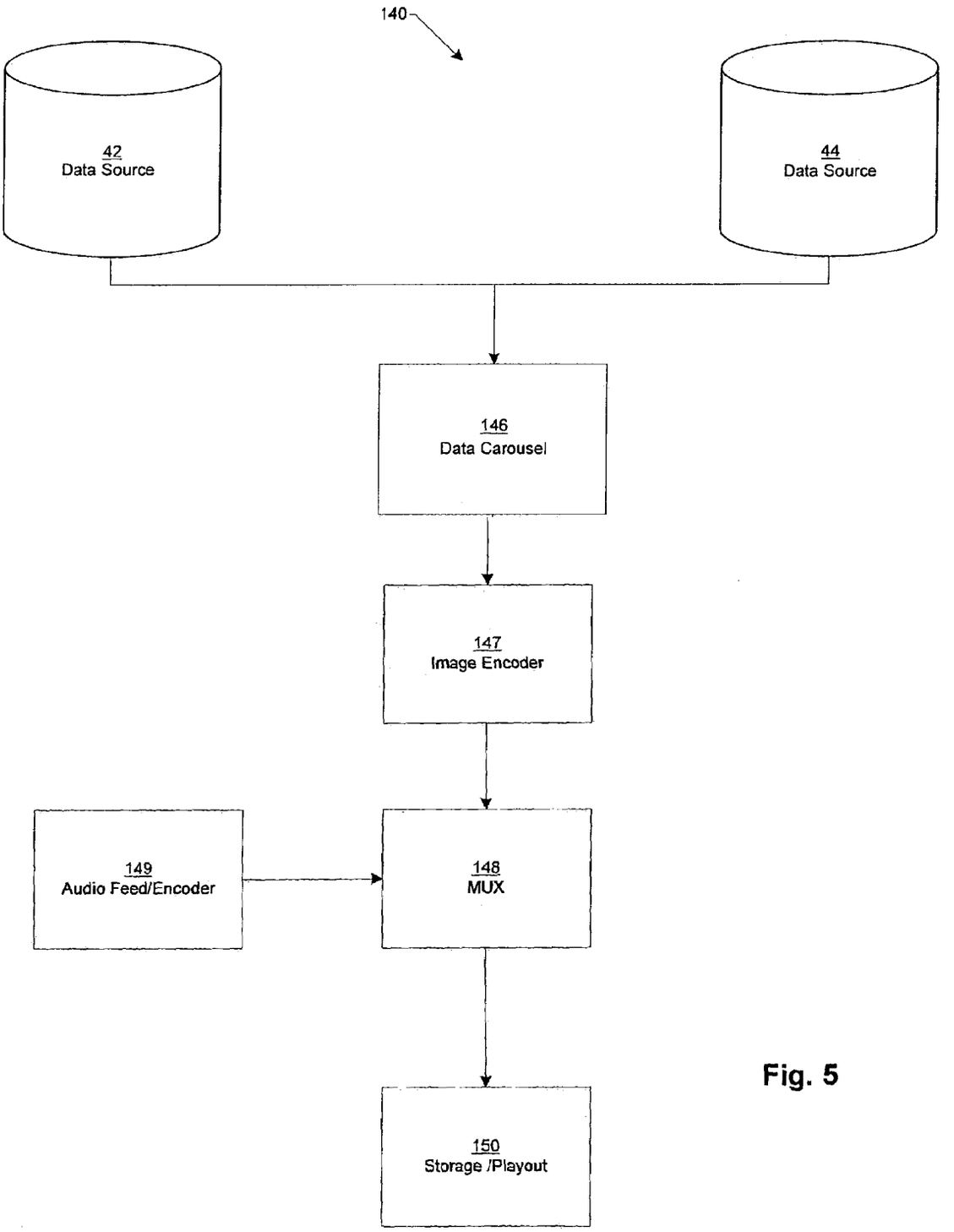
140
42
Data Source
44
Data Source
146
Data Carousel
147
Image Encoder
149
Audio Feed/Encoder
148
MUX
150
Storage /Playout

Fig. 5

METHOD AND SYSTEM FOR DISPLAYING CONTENT WHILE REDUCING BURN-IN OF A DISPLAY

FIELD OF THE INVENTION

This invention is related to a method and system for displaying content while prolonging the life of a display by reducing phosphor burning on the display.

BACKGROUND OF THE INVENTION

Displays such as cathode ray tubes (CRTs) are well known for displaying motion pictures and other content such as graphical or textual content. A typical CRT has a screen that is coated on an inner surface with phosphorescent material arranged in a given pattern. The phosphorescent material glows when bombarded by electron beams emanating from electron guns to form a pattern corresponding to an image. In time, the glowing causes the phosphorescent material to wear, thus affecting its ability to display an image on the screen. It is desirable to have the phosphorescent material wear evenly across the entire screen so that over time the contrast and image display capabilities are uniform across the entire screen. Similar wear can occur with projection and plasma displays as well. It is equally desirable for these devices to exhibit even wear of the materials that facilitate their luminance.

In displays, for example, images move frequently as in a motion picture, thus allowing various parts of the phosphorescent material on the screen to glow at different times. This has an averaging effect on the wear characteristics such that no localized area of the phosphorescent material on the screen wears more or less than an adjacent localized area. However, in other instances, displayed images may contain various stationary content such as pictures, text, graphics or other stationary content. Additionally, as in the case of text, a sharp contrast may exist between the glowing areas of the text and the adjoining areas of the screen. The stationary aspect of the image, and especially the sharp contrast combined with the stationary aspect, causes uneven phosphorescent material wear characteristics between adjacent localized areas on the screen. Damage can result to the phosphorescent screen in these areas such that images are burned into the screen leaving an undesirable permanent scar in the phosphorescent coating. As a consequence, when further images are displayed in the scarred area, the outline of the image may be blurred or the outline of the scar may remain partially or totally visible. This effect is well known in the industry as screen burn-in.

In order to address this burn-in problem, various methods have been developed. For example, in computer applications where a CRT is used as a monitor, the computer generates various screen savers which turn off the still text and replace it with moving images until the user desires to view the textual information again at which time the screen saver is removed.

U.S. Pat. No. 4,677,430 teaches a method for operating a display monitor to prevent burn-in of the screen. This patent discloses a method of imperceptibly moving displayed images by changing the temporal relationship between the information signal transmitted to the monitor and signals used to synchronize the scanning of the screen. The synchronizing signal is delayed with respect to the information signal and the delay is sequentially increased from a minimum delay to a maximum delay and then sequentially decreased back to the minimum delay over a relatively long period of time. The effect of this method is that the entire screen is shifted by a vertical displacement and/or a horizontal displacement.

U.S. Patent Application Publication Number US2001/0035874 discloses a method for reducing burn-in of a CRT that is used in closed circuit television (CCTV) applications. In these applications, text is typically overlaid on a video image, usually at the bottom of the screen. This patent application teaches a method of moving the overlaid text in a window by an amount in either the x or y-axes. This US2001/0035874 allows for textual information to be moved on the screen by inserting a blank space or moving a blank space in each character line by utilizing the character generator chip to provide blanked out portions. The method periodically changes the location of the textual information overlaid onto the video image by altering the information itself so that the information is continuously available, but does not remain in the same place for prolonged period of time thus avoiding burn-in of the textual information.

In certain applications, for example, in the transmission of music over cable television or satellite television networks, various content is typically displayed in conjunction with a broadcast music channel. In other applications, such as local display of advertising content on an in store display, or various other local broadcasts some content may remain stationary, resulting in screen burn-in. This content may include various components, such as, but not limited to, an image of the album cover, artist information, music trivia, channel title, various logos, advertising material, and various other content. Some of the content may remain relatively stationary on the screen with risk of causing burn-in. The methods developed thus far are each problematic or unusable in this application. For example, screen savers are not usable since they typically make the content temporarily unavailable or unreadable. The method utilized in U.S. Pat. No. 4,677,430 discussed above is not feasible for this application because it is undesirable and impractical to modify the synchronizing signal in order to cause shifting of the screen. The method of U.S. Patent Application Publication Number US2001/0035874 allows for textual information to be moved on the screen by inserting a blank space or moving a blank space in each character line by utilizing the character generator chip to provide blanked out portions. This method is not feasible for non-textual content that is displayed as an image in an area of the screen.

What is needed is a system and method for reducing screen burn-in of a user's display which is useful in applications where various content including but not limited to images, text, or graphics is displayed.

SUMMARY OF THE INVENTION

The invention provides a method and system for reducing uneven burn-in of a display during usage. A plurality of assets that may include text, graphics, and video are stored and then gathered. These assets are then assembled based on a template to form a video frame or "screen", which is subsequently output to a display. Based upon a trigger, the assets are gathered again and reassembled in a second template to form a second video frame or "screen" wherein the assets are in positions on the screen, which are different from those of the first screen. The second screen is subsequently output to the display.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described by way of example with reference to the accompanying figures of which:

FIG. **1** is a diagrammatic view of a screen for display according to the present invention.

FIG. **2** is a second diagrammatic view of a screen for display according to the present invention.

FIG. **3** is a third diagrammatic view of a screen for display according to the present invention.

FIG. **4** is a block diagram of an exemplary system for generating screens for broadcast according the present invention.

FIG. **5** is a block diagram of a second exemplary system for generating screens according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

The method for displaying content while reducing burn-in on a display will now be described with reference to FIGS. **1**–**3**.

Referring first to FIG. **1**, an exemplary screen **1** is shown containing various information and other content. Each of the items of content will hereinafter be referred to as assets. These assets may include but are not limited to textual information, motion picture video, graphics, control features such as buttons or pull down menus, promotional materials, or other control mechanisms. Referring first to FIG. **1**, a plurality of assets is displayed on the screen **1**. Those reasonably skilled in the art will appreciate that while certain assets will be described in these embodiments, other types of assets may be substituted. FIG. **1** shows a screen **1** which is displayed coincident with the transmission of a broadcast music channel. The screen **1** contains various assets including a logo **10**, a song add button **12**, a download button **14**, a personalized channel choice button **16**, a channel name **18**, album art 20, title track label and artist information **22**, promotional/advertising panels **24**, **28** and a buy button **26**. The logo and the album art assets **10**, **20** contain graphical content while the channel name and title track label and artist assets **18**, **22** contain primarily textual content but may also contain graphical content. The promotion/advertising panels **24**, **28** may contain a combination of graphic and textual content and may alternatively contain motion picture video content. The assets described thus far namely **10**, **18**, **20**, **22**, **24**, and **28** are primarily for the purpose of conveying information to the viewer either graphically, textually, or through video. The remaining assets namely the song add button **12**, the download button **14**, the personalized choice button **16**, or the buy button **26** may each contain graphical and/or textual content for the purpose of allowing the user to make a selection or transfer control of the system to another sub-screen for various purposes. For example, these control buttons may be utilized to create a personalized music channel, to indicate music preferences of the user, to download a selected song, or to buy a selected album or track. It should be noted that each of the assets **12**, **14**, **16**, **26** are arranged on the screen **1** in a given orientation and at a selected location, which is shown here as being bound by a border. It should be understood that in all cases the border is simply indicative of the location of the particular asset on the screen but that the border is not necessarily visible to the viewer.

In order to reduce screen burn-in, each of the assets may be shuffled around the screen **1** to create alternate orientations. For example, in FIG. **2**, screen **2** is shown in which some of the assets are located in different positions from those shown in screen **1**. For example, each of the assets has been relocated on the screen **2** except for the promotional/advertising panel **24**, **28** that remains in the same location. If, for example, the content within the promotional/advertising panel **24**, **28** changes over time, the need to move this asset around the screen in order to prevent burn-in is reduced. Therefore, in situations where content of an asset is changing within its location on a particular screen, the need to move the asset around the screen is either reduced or eliminated. Such changing may be in the form of changing graphics or video content.

FIG. **3** shows yet another screen in which all of the assets have been moved to alternate locations. The assets are moved to specified locations to prevent any stationary asset from remaining in one location on the screen for an extended period of time. The assets may be moved according to a specified movement arrangement, for example, from the arrangement of screen **1** to the arrangement of screen **2** then to the arrangement of screen **3** and subsequently to other arrangements thereafter returning to the arrangement of screen **1**. The movement could alternatively be conducted according to a suitable random algorithm, which ensures that the resultant locations of each asset are such that there is no overlap of assets.

A time interval may be set for switching between screens **1**, **2**, and **3**, or the change from screen to screen may be triggered by an event. For example, in an embodiment for transmitting a broadcast music channel, screen arrangements may change from screen **1** to screen **2** to screen **3** and other subsequent screens at the beginning of each new song being broadcast. Additionally, as mentioned above, it should be understood that assets may be selectively moved relative to each other or certain assets may remain fixed on the screen while others move. Those fixed assets are preferably ones in which the graphics, text, or video image within the asset changes at some interval. Those assets which are primarily textual or graphical and remain the same, for example the logo **10**, should be moved to alternate locations from screen to screen in order to reduce screen burn-in in any one location.

An alternate embodiment of the method according to the present invention will be described with reference to FIG. **1**. Instead of shuffling the assets as described above from screen **1** to screen **2** to screen **3** and so on, each asset may be incrementally moved along one or two axes on the screen as shown by the phantom lines in FIG. **1**. For example, the logo **10** may be moved a given number of pixels along the y-axis a distance Δy and may also be moved a number of pixels along the x-axis a distance Δx. It should be understood that while the logo **10** is shown as being moved in two axes it may alternatively be moved in a single axis x or y. The movement in a single axis is best shown in the promotion/advertising panel **24**, **28** which has been shifted along the x axis a small amount to the left in FIG. **1**. The buy button **26** is also shown by way of example as being shifted a very small amount namely a few pixels in each of the x and y axes. It should be understood that while only three assets **10**, **26**, **24**, **28** are shown here as being shifted or moved, each and every asset on the screen is capable of being similarly shifted either in a single axis or along both axes. Each asset may be shifted independent of the other and relative to each other without the need for shifting all assets together. In this way, assets can be shifted relative to each other incrementally along a predetermined pattern or randomly in such a way that their movement does not cause them to overlap. Additionally, the period between asset

movements may be predetermined or random and the period may affect one or a plurality of assets at a given time.

An exemplary embodiment of a system for reducing burn-in of a display will now be described with reference to FIG. **4**. An audio broadcast system **40** is designed for transmitting various-music channel broadcasts over a network such as a cable television network or a satellite network for distribution to a plurality of subscribers. It should be understood, however, that while the system described here is utilized for the broadcast of audio channels, the system is adaptable for use in broadcasting other content as well.

In this exemplary embodiment, a data carousel subsystem **46** retrieves data from one or a plurality of data sources **42**, **44**. The first data source **42** may contain, for example, information to support the channel name asset **18** and may include a song identification database, which contains playlist information, which is programmed by genre or channel for a given type of music. The first data source **42** may be managed by and associated with a server, which allows the database to be updated and managed, and also facilitates communication with the data carousel subsystem **46**.

The second data source **44** may include, for example, information to support the album art asset **20**, the title and track label and artist asset **22**, and information to support other assets. The second data source **44** may also be associated with and connected to a server or other computer for managing the database and/or facilitating communications with the data carousel subsystem **46**. It should be understood that while two data sources are shown here, a single data source or a plurality of data sources may be connected to or in communication with the data carousel subsystem **46**. The data sources **42**, **44** may or may not be located in a single location and may or may not be co-located with the data carousel subsystem **46**.

The data carousel subsystem **46** may be implemented utilizing a personal computer or a general-purpose computer having associated storage capabilities. The data carousel subsystem **46** receives data from data sources **42**, **44** and may also receive data, which is downloadable from other data sources or entered directly into the data carousel subsystem **46** through user intervention. The data carousel subsystem **46** contains template information including a plurality of templates for the asset arrangements of screens **1**, **2**, and **3**. As an alternative, the template information may be housed in one of the data sources **42**, **44**. The data carousel subsystem **46** is capable of managing/creating the templates, which may be coded utilizing HTML, XML or other suitable protocols for creating templates/screens having text and other assets such as those described above. Additionally, the data carousel subsystem **46** may store and execute suitable algorithms for moving selected assets such as the logo **10**, the buy button **26**, and the promotional/advertising panel **24**, **28** as was shown and described above in the alternate methods with reference to FIGS. **1**–**3**.

The broadcast playout system **50** is the mechanism by which fundamental programming content is played from recorded media. It is often based on commercially available broadcast automation hardware and software. The broadcast playout system **50** sends audio content, such as queued songs, to the audio encoder **49** and at a pre-determined time, sends a trigger to the data carousel subsystem **46** to initiate an associated data feed. The data carousel subsystem **46** generates a trigger to an MPEG encoder **47**. In response to the trigger, the MPEG encoder **47** pulls template information, images, and text from the data carousel subsystem **46** and creates an MPEG video frame, having embedded assets such as screens **1**, **2** or **3** which are associated with the currently queued song. This is accomplished by populating a given template or screen with current information/content from data sources **42**, **44**. It should be understood that this process may be executed for a plurality of channels simultaneously. The MPEG encoder **47** then creates an MPEG transport stream for all channels with the embedded MPEG video frames. The MPEG encoder **47** may be implemented utilizing a commercially available encoder or a general-purpose computer. Based upon a trigger from the broadcast playout system **50**, a multiplexer **48** receives the MPEG transport stream from the MPEG encoder **47** and simultaneously receives an encoded audio feed from an audio encoder **49**. The multiplexer **48** serves to combine the audio feed from the audio encoder **49** and the associated encoded MPEG transport stream from the MPEG encoder **47**. The multiplexer **48** then feeds the multiplexed signal out for broadcast in the form of a video transport stream to the head end of a service provider, such as a cable television network or a satellite network provider as is well known in the art.

A second exemplary embodiment of an alternate system for reducing screen burn-in of a display will now be described with reference to FIG. **5**. System **140** is designed for storing or locally transmitting various video and/or audio content according to the method described in reference to FIGS. **1**–**3** above.

In this second exemplary embodiment, a data carousel subsystem **146** retrieves data from one or a plurality of data sources **42**, **44** as described in the embodiment of FIG. **4** above. It should be understood that the data sources **42**, **44** may contain various assets not limited to those shown in the examples of FIGS. **1**–**3**. The data carousel subsystem **146** may be implemented as part of a personal computer or general purpose computer having associated storage capabilities. Alternatively, the data carousel subsystem **146** may be implemented as a separate personal computer or general purpose computer having associated storage capabilities. The data carousel subsystem **146** contains similar template information as the data carousel subsystem **46** for creating various asset arrangements. It should be understood that the template information may be modified according to desired asset placement and replacement on the resultant screens. The data carousel subsystem **146** also has template management capabilities similar to the data carousel subsystem **46**. Additionally, the data carousel subsystem **146** may store and execute suitable algorithms for moving selected assets as was shown and described above in the alternate methods with reference to FIGS. **1**–**3**.

The image encoder **147** receives output from the data carousel subsystem **146** to create a video frame. The image encoder **147** may be implemented within a personal computer or general purpose computer or may alternatively be implemented as a separate piece of encoding equipment which is commercially available for generating encoded video frames.

An audio feed or audio encoder **149** supplies audio which is associated with the video frame output of the image encoder **147**. It should be understood that the audio encoder **149** is an optional element in this system and may be removed in applications where only video without audio is desired. The audio encoder **149** may be implemented utilizing commercially available equipment or may be implemented as part of a personal or general purpose computer.

A multiplexer **148** serves to combine the audio feed/encoder output **149** with the image encoder output **147** to create a transport stream at its output. It should be understood that the audio encoder **149** and the image encoder **147**

may be triggered or otherwise timed to send output to the multiplexer **148** simultaneously in order to match desired audio with desired image content. It should also be understood that the multiplexer **148** may be removed from the system **140** when the optional audio encoder **149** is not used. In this case, the image encoder **147** output could be fed directly into the storage/playout device **150** which will be described below.

The output of the multiplexer **148** is fed to a storage/playout device **150**. The storage/playout device **150** may be implemented utilizing any display or transmission device which is capable of displaying or transmitting video images. Alternatively, in applications where playout is desired at a later time, the storage/playout device **150** may be implemented utilizing a recorder for creating or writing to any suitable storage medium such as DVD, CD ROM, hard disk, or any other suitable read only or rewritable storage medium. The storage/playout device **150** may be alternatively implemented utilizing portable memory devices according to PCMCIA or other suitable memory standards. The storage/playout device **150** could also be a direct playout device such as a display. The system **140** advantageously allows for utilizing the methods of the present invention for creating various stored content which when played back will reduce screen burn-in.

The elements of FIG. **5** may be incorporated within a personal or general purpose computer to reduce screen burn-in of a computer monitor by moving relatively still content on the computer display or monitor according to the methods of the present invention.

While this system **140** has been described in the context of generating a single frame or screen for display, it should be understood that this system **140** is utilized in executing the methods described above wherein the process is repeated such that assets are moved on the display according to the stored templates to reduce screen burn-in. It should also be understood that the system **140** is capable of simultaneously transmitting, playing out, or storing such content for later play back utilizing the methods disclosed above.

The system **40** advantageously reduces screen burn in by moving assets on the screen according to stored template information without modifying a transmitted TV signal or video transport stream. Assets are shifted on screen prior to output of the transport stream therefore eliminate the need to modify any signal at the display as required by the prior art.

The foregoing illustrates some of the possibilities for practicing the invention. Many other embodiments are possible within the scope and spirit of the invention. For example, it should be understood that this method and system may be applicable to broadcast systems as well as systems that display information from sources local to the display, including but not limited to video disc players, computers, etcetera. It is, therefore, intended that the foregoing description be regarded as illustrative rather than limiting, and that the scope of the invention is given by the appended claims together with their full range of equivalents.

What is claimed is:

1. A method for reducing burn-in of a display during a broadcast comprising:

storing a plurality of distinct visual assets, wherein the plurality of distinct visual assets includes a first visual asset comprising a first complete image and a second visual asset comprising a second complete image;

in response to a trigger, automatically retrieving the first and second assets and generating a first screen comprising the first and second complete images, wherein the first complete image is positioned at a first screen position and the second complete image is positioned at a second screen position that is different than the first screen position;

after generating the first screen, broadcasting the first screen to a plurality of broadcast receivers;

generating a screen update trigger after broadcasting the first screen;

in response to the screen update trigger, generating a second screen comprising the first and second images, wherein the screen position of the first image for the second screen is different than the screen position of the first image for the first screen; and

after generating the second screen, broadcasting the second screen to the plurality of broadcast receivers.

2. The method of claim **1**, further comprising storing a plurality of screen templates, wherein the screen position of the first asset in the first screen and the screen position of the second asset in the first screen are determined by one of said plurality of templates.

3. The method of claim **2**, wherein the first screen is multiplexed with an audio signal corresponding to a first portion of an audio recording to generate a multiplexed signal.

4. The method of claim **3**, wherein the multiplexed signal is broadcast over a broadband network to the plurality of broadcast receivers.

5. The method of claim **3**, wherein the first complete image is an image of an album cover associated with the audio recording and the second complete image is a logo.

6. The method of claim **1**, wherein each broadcast receiver is operable to transmit the first screen to a display device coupled to the broadcast receiver.

7. The method of claim **1**, further comprising:

storing a plurality of audio recordings in a storage unit, wherein the first visual asset corresponds to at least one of the plurality of audio recordings;

retrieving the at least one audio recording;

broadcasting to the plurality of broadcast receivers an audio signal corresponding to a portion of the audio recording concurrently with the first screen so that the plurality of broadcast receivers receive the broadcast audio signal and the first screen concurrently.

8. The method of claim **1**, further comprising queuing the first screen for broadcast to the plurality of broadcast receivers immediately after generating the first screen.

9. The method of claim **1**, wherein the screen position of the first image for the first screen is different than the screen position of the first image for the second screen by no more than a few pixels in any direction.

10. A method of preventing screen burn-in comprising:

storing a plurality of image files in data store, each image file containing a complete image;

storing a plurality of audio recordings

storing in a database data that associates each of said plurality of audio recordings with at least one of said image files;

storing a playlist that includes a list of audio recording identifiers, each of which identifies one of the plurality of audio recordings;

using the playlist to select an audio recording from said plurality of audio recordings;

retrieving the selected audio recording;

retrieving from the data store a first image file and a second image file, wherein the first image file stores a first complete image and the second image file stores a

second complete image, and wherein the first image file is associated with the selected audio recording;

after retrieving the first and second image files, generating a first screen comprising the first complete image stored in the first image file and the second complete image stored in the second image file, wherein said first image is positioned at a first screen position and said second image is positioned at a second screen position;

concurrently transmitting to a broadcast receiving device, via a network, a first portion of the audio recording and the generated first screen;

generating a second screen while a portion of the audio recording is being transmitted to the broadcast receiving device, wherein the second screen comprises the first complete image and the second complete image, wherein, for the second screen, the first image has a position that is different than the position it had for the first screen; and

concurrently transmitting the generated second screen and a second portion the audio recording to the broadcast receiving device.

11. The method of claim **10**, wherein the step of generating the first screen comprises using a template to determine the first screen position for the image from the first image file.

12. The method of claim **10**, wherein the step of concurrently transmitting to the receiving device, via a network, the first portion of the audio recording and the generated first screen comprises multiplexing an audio signal corresponding to the first portion of the audio recording with the first screen to generate a multiplexed signal.

13. The method of claim **12**, wherein the multiplexed signal is broadcast over a broadband network.

14. The method of claim **10**, wherein the difference between the position of the first image in the first screen and the position of said image in the second screen is not more than a few pixels in any direction.

15. A system for reducing screen burn-in caused by transmission of screens to a display, the system comprising:

at least one data source for housing screen assets and a plurality of templates, wherein each template associates each of a plurality of asset types with a unique screen position;

a data carousel subsystem for retrieving screen assets and assembling a screen by positioning the retrieved screen assets in accordance with a template selected from the plurality of templates; and

a transmitter for transmitting to a receiving device, via a network, the assembled screen concurrently with an audio signal corresponding to a selected audio recording.

16. The system of claim **15**, further comprising a multiplexer for multiplexing the assembled screen with the audio signal.

17. The system of claim **16**, further comprising a broadcast playout system configured to select audio recordings and configured to transmit a trigger to the data carousel upon selecting an audio recording.

18. The system of claim **17**, wherein the data carousel system is configured to assemble a screen in response to receiving a trigger from the broadcast playout system.

19. The system of claim **15**, wherein a first template associates a first asset type with a first screen position and a second template associates the first asset type with a second screen position, wherein the distance between the first position and the second position is not more than a few pixels.

20. The system of claim **15**, wherein the data carousel subsystem is part of a computer.

21. The system of claim **15**, wherein the data carousel subsystem comprises a computer.

22. In an environment comprising an audio transmission system and a receiving device for receiving audio signals and images transmitted from the transmissions system, a method for displaying the images on a display device coupled to the receiving device, comprising:

(a) receiving at the receiving device an audio signal transmitted from the transmission system, wherein the audio signal corresponds to a specific audio recording, and outputting the audio signal so that a user of the device may listen to the audio recording;

(b) while performing step (a):

(1) receiving at the receiving device a first complete image and a second complete image transmitted from the transmission system, wherein the images are received at the same time;

(2) in response to receiving the images, concurrently displaying the images on the display screen, wherein the first image covers only a first portion of the display screen and the second image covers only a second portion of the display screen, wherein the first portion of the display screen differs from the second portion;

(3) after performing steps (1) and (2), receiving at the receiving device data transmitted from the transmission system;

(4) in response to receiving the data, displaying the first image on the display screen so that the first image covers only a third portion of the display screen and displaying the second image on the display screen so that the second image covers only a fourth portion of the display screen, wherein the third portion of the display screen is different than the first portion, the fourth portion of the display screen is different than the second portion, and the third portion does not overlap at all with the fourth portion.

23. The method of claim **22**, wherein the first image is an image of a CD cover corresponding to a CD on which the audio recording is recorded.

24. The method of claim **22**, wherein the second image is an image of a logo.

25. The method of claim **22**, wherein the center of the first portion of the display screen is not more than a few pixels apart from the center of the third portion of the display screen.

26. The method of claim **22**, wherein the data transmitted from the transmission system comprises the first and second images.

* * * * *

CIVIL COVER SHEET

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I. (a) PLAINTIFFS

MUSIC CHOICE

(b) County Of Residence Of First Listed Plaintiff: Montgomery County, Pennsylvania
(Except In U.S. Plaintiff Cases)

(c) Attorneys (Firm Name, Address, And Telephone Number)
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DEFENDANT

VIACOM, INC.; VIACOM INTERNATIONAL, INC.; and MTV NETWORKS

County Of Residence Of First Listed Defendant:
(IN U.S. PLAINTIFF CASES ONLY)
NOTE: IN LAND CONDEMNATION CASES, USE THE LOCATION OF THE TRACT OF LAND INVOLVED

Attorneys (If Known)

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	PTF	DEF		PTF	DEF
Citizen of This State	1	1	Incorporated or Principal Place of Business in This State	4	4
Citizen of Another State	2	2	Incorporated and Principal Place of Business in This State	5	5
Citizen or Subject of a Foreign Country	3	3	Foreign Nation	6	6

V. NATURE OF SUIT (Place An X In One Box Only)

CONTRACT

- ☐ 110 Insurance
- ☐ 120 Marine
- ☐ 130 Miller Act
- ☐ 140 Negotiable Instrument
- ☐ 150 Recovery of Overpayment & Enforcement of Judgment
- ☐ 151 Medicare Act
- ☐ 152 Recovery of Defaulted (Excl. Veterans)
- ☐ 153 Recovery of Overpayment of Veteran's Benefits
- ☐ 160 Stockholders' Suits
- ☐ 190 Other Contract
- ☐ 195 Contract Product Liability

REAL PROPERTY

- ☐ 210 Land Condemnation
- ☐ 220 Foreclosure
- ☐ 230 Rent Lease & Ejectment
- ☐ 240 Torts to Land
- ☐ 245 Tort Product Liability
- ☐ 290 All Other Real Property

TORTS

PERSONAL INJURY
- ☐ 310 Airplane
- ☐ 315 Airplane Product Liability
- ☐ 320 Assault, Libel & Slander
- ☐ 330 Federal Employers Liability
- ☐ 340 Marine
- ☐ 345 Marine Product Liability
- ☐ 350 Motor Vehicle
- ☐ 355 Motor Vehicle Product Liability
- ☐ 360 Other Personal Injury

PERSONAL INJURY
- ☐ 362 Personal Injury - Med Malpractice
- ☐ 365 Personal Injury - Product Liability
- ☐ 368 Asbestos Personal Injury Product Liability

PERSONAL ROPERTY
- ☐ 370 Other Fraud
- ☐ 371 Truth in Lending
- ☐ 380 Other Personal Property Damage
- ☐ 385 Property Damage Product Liability

CIVIL RIGHTS
- ☐ 441 Voting
- ☐ 442 Employment
- ☐ 443 Housing/ Accommodations
- ☐ 444 Welfare
- ☐ 440 Other Civil Rights

PRISONER PETITIONS
- ☐ 510 Motions to Vacate Sentence Habeas Corpus
- ☐ 530 General
- ☐ 535 Death Penalty
- ☐ 540 Mandamus & Other
- ☐ 550 Civil Rights
- ☐ 555 Prison Condition

FORFEITURE/PENALTY
- ☐ 610 Agriculture
- ☐ 620 Other Food & Drug
- ☐ 625 Drug Related Seizure of Property 21 U.S.C. 881
- ☐ 630 Liquor Laws
- ☐ 640 R R & Truck
- ☐ 650 Airline Regs
- ☐ 660 Occupational Safety/Health
- ☐ 690 Other

LABOR
- ☐ 710 Fair Labor Standards Act
- ☐ 720 Labor/Mgmt Relations
- ☐ 730 Labor/Mgmt. Reporting & Disclosure Act
- ☐ 740 Railway Labor Act
- ☐ 790 Other Labor Litigation
- ☐ 791 Empl Ret Inc Security Act

BANKRUPTCY
- ☐ 422 Appeal 28 U.S.C. 158
- ☐ 423 Withdrawal 28 U.S.C. 157

PROPERTY RIGHTS
- ☐ 820 Copyrights
- ☒ 830 Patent
- ☐ 840 Trademark

SOCIAL SECURITY
- ☐ 861 HIA (1395ff)
- ☐ 862 Black Lung (923)
- ☐ 863 DIWC/DIWW (405(g))
- ☐ 864 SSID Title XVI
- ☐ 865 RSI (405(g))

FEDERAL TAX SUITS
- ☐ 870 Taxes (U.S. Plaintiff or Defendant)
- ☐ 871 IRS - Third Party 26 U.S.C. 7609

OTHER STATUTES
- ☐ 400 State Reapportionment
- ☐ 410 Antitrust
- ☐ 430 Banks and Banking
- ☐ 450 Commerce/ICC Rates, etc.
- ☐ 460 Deportation
- ☐ 470 Racketeer Influenced and Corrupt Organizations
- ☐ 810 Selective Service
- ☐ 850 Securities/Commodities/ Exchange
- ☐ 875 Customer Challenge 12 U.S.C. 3410
- ☐ 891 Agricultural Acts
- ☐ 892 Economic Stabilization Act
- ☐ 893 Environmental Matters
- ☐ 894 Energy Allocation Act
- ☐ 895 Freedom of Information Act
- ☐ 900 Appeal of Fee Determination Under Equal Access to Justice
- ☐ 950 Constitutionality of State Statutes
- ☐ 890 Other Statutory Actions

IV. ORIGIN (PLACE AN "X" IN ONE BOX ONLY)

☒ 1 Original Proceeding ☐ 2 Removed from Court ☐ 3 Remanded from Appellate Court ☐ 4 Reinstated or Reopened ☐ 5 Transferred from another district (specify) ☐ 6 Multidistrict Litigation ☐ 7 Appeal to District Judge from Magistrate Judgment

VI. CAUSE OF ACTION

(CITE THE U.S. CIVIL STATUTE UNDER WHICH YOU ARE FILING AND WRITE BRIEF STATEMENT OF CAUSE DO NOT CITE JURISDICTIONAL STATUTES UNLESS DIVERSITY.):
35 U.S.C. §§ 271, 281, and 283-285

Brief description of cause:
Cause of action for patent infringement.

VII. REQUESTED IN COMPLAINT: CHECK IF THIS IS A UNDER F.R.C.P. 23 **CLASS ACTION** YES NO **DEMAND $**

Check YES only if demanded in complaint
JURY DEMAND: ☒ YES NO

VIII. RELATED CASE(S) (See instructions) **IF ANY** JUDGE: DOCKET NUMBER:

DATE March 4, 2008 SIGNATURE OF ATTORNEY OF RECORD

FOR OFFICE USE ONLY

RECEIPT # _____ AMOUNT _____ APPLYING IFP _____ JUDGE _____ MAG. JUDGE _____

INSTRUCTIONS FOR ATTORNEYS COMPLETING CIVIL COVER SHEET FORM JS-44

Authority For Civil Cover Sheet

The JS-44 civil cover sheet and the information contained herein neither replaces nor supplements the filings and service of pleading or other papers as required by law, except as provided by local rules of court. This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of Court for the purpose of initiating the civil docket sheet. Consequently a civil cover sheet is submitted to the Clerk of Court for each civil complaint filed. The attorney filing a case should complete the form as follows:

I. (a) **Plaintiffs - Defendants**. Enter names (last, first, middle initial) of plaintiff and defendant. If the plaintiff or defendant is a government agency, use only the full name or standard abbreviations. If the plaintiff or defendant is an official within a government agency, identify first the agency and then the official, giving both name and title.

(b) **County of Residence**. For each civil case filed, except U.S. plaintiff cases, enter the name of the county where the first listed plaintiff resides at the time of filing. In U.S. plaintiff cases, enter the name of the county in which the first listed defendant resides at the time of filing. (NOTE: In land condemnation cases, the county of residence of the "defendant" is the location of the tract of land involved).

(c) **Attorneys**. Enter firm name, address, telephone number, and attorney of record. If there are several attorneys, list them on an attachment, noting in this section "(see attachment)."

II. **Jurisdiction**. The basis of jurisdiction is set forth under Rule 8(a), F.R.C.P., which requires that jurisdictions be shown in pleadings. Place an "X" in one of the boxes. If there is more than one basis of jurisdiction, precedence is given in the order shown below.

United States plaintiff. (1) Jurisdiction is based on 28 U.S.C. 1345 and 1348. Suits by agencies and officers of the United States are included here.

United States defendant. (2) When the plaintiff is suing the United States, its officers or agencies, place an "X" in this box.

Federal question. (3) This refers to suits under 28 U.S.C. 1331, where jurisdiction arises under the Constitution of the United States, an amendment to the Constitution, an act of Congress or a treaty of the United States. In cases where the U.S. is a party, the U.S. plaintiff or defendant code takes precedence, and box 1 or 2 should be marked.

Diversity of citizenship. (4) This refers to suits under 28 U.S.C. 1332, where parties are citizens of different states. When Box 4 is checked, the citizenship of the different parties must be checked. (See Section III below; federal question actions take precedence over diversity cases.)

III. **Residence (citizenship) of Principal Parties**. This section of the JS-44 is to be completed if diversity of citizenship was indicated above. Mark this section for each principal party.

IV. **Cause of Action**. Report the civil statute directly related to the cause of action and give a brief description of the cause.

V. **Nature of Suit**. Place an "X" in the appropriate box. If the nature of suit cannot be determined, be sure the cause of action, in Section IV above, is sufficient to enable the deputy clerk or the statistical clerks in the Administrative Office to determine the nature of suit. If the cause fits more than one nature of suit, select the most definitive.

VI. **Origin**. Place an "X" in one of the seven boxes.

Original Proceedings. (1) Cases which originate in the United States district courts.

Removed from State Court. (2) Proceedings initiated in state courts may be removed to the district courts under Title 28 U.S.C. Section 1441. When the petition for removal is granted, check this box.

Remanded from Appellate Court. (3) Check this box for cases remanded to the district court for further action. Use the date of remand as the filing date.

Reinstated or Reopened. (4) Check this box for cases reinstated or reopened in the district court. Use the reopening date as the filing date.

Transferred from Another District. (5) For cases transferred under Title 28 U.S.C. Section 1404(a). Do not use this for within district transfers or multidistrict litigation transfers.

Multidistrict Litigation. (6) Check this box when a multidistrict case is transferred into the district under authority of title 28 U.S.C. Section 1407. When this box is checked, do not check (5) above.

Appeal to District Judge from Magistrate Judgment. (7) Check this box for an appeal from a magistrate's decision.

VII. **Requested in Complaint**. Class Action. Place an "X" in this box if you are filing a class action under Rule 23, F.R.Cv.P.

Demand. In this space enter the dollar amount (in thousands of dollars) being demanded or indicate other demand such as a preliminary injunction.

Jury Demand. Check the appropriate box to indicate whether or not a jury is being demanded.

VIII. **Related Cases**. This section of the JS-44 is used to reference relating pending cases if any. If there are related pending cases, insert the docket numbers and the corresponding judge names for such cases.

Date and Attorney Signature. Date and sign the civil cover sheet.

AO FORM 85 RECEIPT (REV. 9/04)

United States District Court for the District of Delaware

Civil Action No. 08-130

FILED
CLERK, U.S. DISTRICT COURT
DISTRICT OF DELAWARE
2008 MAR -4 PM 4:12

ACKNOWLEDGMENT OF RECEIPT FOR AO FORM 85

NOTICE OF AVAILABILITY OF A UNITED STATES MAGISTRATE JUDGE TO EXERCISE JURISDICTION

I HEREBY ACKNOWLEDGE RECEIPT OF 4 COPIES OF AO FORM 85.

3/4/08
(Date forms issued)

(Signature of Party or their Representative)

DAVID FOLSTMAN
(Printed name of Party or their Representative)

Note: Completed receipt will be filed in the Civil Action